AMERICAN JOURNAL OF PHARMACY.

OCTOBER, 1851.

OBSERVATIONS ON THE SASSY BARK OF WESTERN AFRICA AND ON THE TREE PRODUCING IT.

By William Procter, Jr.

Various travellers, from the celebrated Mungo Park to the more recent explorers of Western and Central Africa, have alluded in their narratives to the use of a poisonous bark as an ordeal to which persons suspected of witch-craft, secret murder, and other crimes in the code of those countries, are subjected, as a test of their innocence or guilt. In Congo, it is known as the "ordeal bark," and in Ashantee and the neighboring settlements of Liberia, as "doom bark," and the process of its administration as "taking doom." It is also said to be resorted to as a means of gratifying private revenge, an application to which its chemical nature readily admits, and its use, in the opinion of the missionaries, is a great moral evil worthy the attention of the philanthropic.

Moses Sheppard, Esq., of Baltimore—a gentleman whose interest in the welfare of the African race has, for many years past, connected him, as a patron, with the Colonization of Western Africa, at Liberia—several years since received from Dr. Samuel F. McGill, of Cape Palmas, a few pounds of *sassy* bark, a portion of which was given to Mr. Charles A. Santos, now of Norfolk, Va., who published an account of its physical, and some of its chemical properties, in this Journal, vol. xxi, p. 97.*

More recently, Mr. Sheppard placed in my hands about two pounds of the bark for examination, but feeling a reluctance to devote time and labor to the investigation of a product, the botanical source of which was unknown, that gentleman kindly offered

* Mr. Santos calls it *saucy* bark. Sassy is the term used by Dr. McGill.

to obtain for me, through his friend Dr. McGill, specimens of the leaves, flowers, and fruit of the sassy tree. About nine months ago a box was received from Liberia containing the leaves, fruit, twigs, wood and bark of the sassy tree, but the flowers, the most important part, were omitted, as the tree was then in fruit. As the flowers then promised have not yet arrived, I have concluded to publish what facts have been collected from travellers, together with those derived from an examination of the specimens.

The tree producing sassy bark has not been described in any of the botanical works in the library of the Academy of Natural Sciences of Philadelphia, including DeCandolle, Lindley and Endlicher, and in the narratives of travellers so little attention has been given to the means of identifying it, that the specimens themselves, imperfect as they are in the absence of the flowers, will afford more light than can be obtained from any other available source.

In Bowditch's Ashantee, page 279, the following paragraph is found:

"Taking doom is the infallible test, when they consider the case too doubtful for human decision. The bark of that tree, (viz: the "doom plant,") is put into a large calabash with water, so as to make a strong infusion; it is stirred up, while the suspected parties sip in turn. It operates instantly and convulsively as a most violent emetic and purge. Those who sip first may recover, and the dregs are frequently left designedly for the obnoxious."

In Tuckey's narrative of a voyage to the river Congo, page 185: "This morning Gangam Kissey (the public accuser and executioner) returned, and we learned that he had denounced three men of another village as the poisoners of the man that died, and the accused were immediately to undergo the ordeal of chewing the poisonous bark, which, if they were guilty, they would retain in the stomach, and this would occasion death, but if innocent, they would vomit."

Ibid, page 200.—"It appears that the bark used in the ordeal is from a species of Cassia."

Ibid, page 329.—"The bark and leaves of the Cassa tree, which Gangam Kissey made use of as an ordeal, were brought to us. They are said to be poisonous."

Bruce, in his Travels, (vol. v. p. 27, quarto edition,) describes

a tree called "sassa," which yields the *sassa gum* of African commerce, and he gives two figures which represent the leaves and flowers. The tree is very analogous in general appearance to that of the sassy bark, flowering in a terminal raceme, with bipinnate leaves, the folioles of which, however, are opposite, whilst those of the sassy are alternate. This tree is the Inga Sassa of Willdenow. (Decandolle.)

In the appendix to Tuckey's voyage, &c., it is stated that "One of the unpublished genera is Erythrophleum, the *red-water tree* of Sierra Leone, *another species of which is the ordeal plant or cassa* of the natives of Congo." This remark is more to the point than any that has been found, because as Sierra Leone is near the locality whence the sassy bark is derived, and as there is strong reason for believing the cassa bark of Congo (why not sassa or sassy as a derivation or corruption?) and sassy bark to be identical, the former of which is attributed to a leguminous tree, said to be a species of Erythrophleum, (vid. ante) is it not reasonable to refer the sassy bark tree of Cape Palmas to the same genus, or at least to one nearly allied, and perhaps not yet described?

Lindley, in his last edition of "The Vegetable Kingdom," places the genus Erythrophleum of Afzelius in the Natural Order, Fabaceæ, sub-order Mimoseæ, and tribe Parkieæ.

Endlicher, Genera Plant, page 1323, characterizes the genus Erythrophleum of Afzelius thus:—"*Flores* hermaphroditi, regulares. *Calyx* quinquefidus subimbricatus. *Corollæ* petala 5. *Stamina* perigyna. *Legumen* compressum, bivalve, polyspermum. Arbor Africæ tropicæ, excelsa; foliis bipinnatis, foliolis oppositis; racemis terminalibus et lateralibus." This agrees with the specimens of sassy, as far as they go, except in the position of the folioles, which will now be described.

The sassy bark is produced by a large tree with spreading branches. In the general appearance of its fructification and foliage it resembles the Gymnocladus of the United States. The leaves (*a*) are bipinnate, the pinnæ are articulated oppositely on the general petiole, and vary from three to six or seven on a side, according as they are taken from near the terminus of a branch or below; in the last case they are larger, and generally the pinnæ nearest the apex are largest. The folioles are subpetiolate, obliquely ovate, and acuminate, from one to three inches

to obtain for me, through his friend Dr. McGill, specimens of the leaves, flowers, and fruit of the sassy tree. About nine months ago a box was received from Liberia containing the leaves, fruit, twigs, wood and bark of the sassy tree, but the flowers, the most important part, were omitted, as the tree was then in fruit. As the flowers then promised have not yet arrived, I have concluded to publish what facts have been collected from travellers, together with those derived from an examination of the specimens.

The tree producing sassy bark has not been described in any of the botanical works in the library of the Academy of Natural Sciences of Philadelphia, including DeCandolle, Lindley and Endlicher, and in the narratives of travellers so little attention has been given to the means of identifying it, that the specimens themselves, imperfect as they are in the absence of the flowers, will afford more light than can be obtained from any other availa-

MISNUM

parties sip in turn. It operates instantly and convulsively as a most violent emetic and purge. Those who sip first may recover, and the dregs are frequently left designedly for the obnoxious."

In Tuckey's narrative of a voyage to the river Congo, page 185: "This morning Gangam Kissey (the public accuser and executioner) returned, and we learned that he had denounced three men of another village as the poisoners of the man that died, and the accused were immediately to undergo the ordeal of chewing the poisonous bark, which, if they were guilty, they would retain in the stomach, and this would occasion death, but if innocent, they would vomit."

Ibid, page 200.—"It appears that the bark used in the ordeal is from a species of Cassia."

Ibid, page 329.—"The bark and leaves of the Cassa tree, which Gangam Kissey made use of as an ordeal, were brought to us. They are said to be poisonous."

Bruce, in his Travels, (vol. v. p. 27, quarto edition,) describes

a tree called "sassa," which yields the *sassa gum* of African commerce, and he gives two figures which represent the leaves and flowers. The tree is very analogous in general appearance to that of the sassy bark, flowering in a terminal raceme, with bipinnate leaves, the folioles of which, however, are opposite, whilst those of the sassy are alternate. This tree is the Inga Sassa of Willdenow. (Decandolle.)

In the appendix to Tuckey's voyage, &c., it is stated that "One of the unpublished genera is Erythrophleum, the *red-water tree* of Sierra Leone, *another species of which is the ordeal plant or cassa* of the natives of Congo." This remark is more to the point than any that has been found, because as Sierra Leone is near the locality whence the sassy bark is derived, and as there is strong reason for believing the cassa bark of Congo (why not sassa or sassy as a derivation or corruption?) and sassy bark to be identi-

MBERED

Fabaceæ, sub-order Mimoseæ, and tribe Parkieæ.

Endlicher, Genera Plant, page 1323, characterizes the genus Erythrophleum of Afzelius thus:—"*Flores* hermaphroditi, regulares. *Calyx* quinquefidus subimbricatus. *Corollæ* petala 5. *Stamina* perigyna. *Legumen* compressum, bivalve, polyspermum. Arbor Africæ tropicæ, excelsa; foliis bipinnatis, foliolis oppositis; racemis terminalibus et lateralibus." This agrees with the specimens of sassy, as far as they go, except in the position of the folioles, which will now be described.

The sassy bark is produced by a large tree with spreading branches. In the general appearance of its fructification and foliage it resembles the Gymnocladus of the United States. The leaves (*a*) are bipinnate, the pinnæ are articulated oppositely on the general petiole, and vary from three to six or seven on a side, according as they are taken from near the terminus of a branch or below; in the last case they are larger, and generally the pinnæ nearest the apex are largest. The folioles are subpetiolate, obliquely ovate, and acuminate, from one to three inches

long and from one to one and a half wide, alternate, smooth, entire, sometimes slightly repand, and varying from three to five or six on a side, one being terminal. The bark of the younger branches and twigs, which is dark gray, is covered with light colored dots, which extend to the receptacles on the raceme.

The legume (*b*) is from two to four inches long, and from one to two wide, violin shaped, of a dark chestnut color, coriaceous, compressed, obtuse at both ends, bivalved, containing from two to five seeds attached by short funiculi, and dehisces by the dorsal suture. The legume contains considerable tannin. The seeds have an oblong oval, flattened form, are black except the hilum, which is brown, smooth and covered with a dry gummy transparent substance, analogous to cerasin, which is dissolved by boiling water, and forms a colorless solution, from which it is precipitated by subacetate of lead, sesqui-chloride of iron and alcohol.

The seed has a hard, horny episperm, and a tough, horny, light grey albumen (*d*), nearly surrounding the cotyledons, and composed of a bassorin-like substance, which swells in boiling water, and becomes translucent like tragacanth. The (*c*) cotyledons are large, compressed, indurated, and yellowish green colored. They have a disagreeable taste, contain chlorophylle and fixed oil, in small quantity, but no starch, nor has this principle been found in any part of the plant.*

The tree must be large, as the section of a branch three inches in diameter exhibited the bark but one-sixteenth of an inch thick, grey colored, while the bark used for poisoning is from three to five-eighths of an inch thick. The young wood has a greyish white color, and is not very dense.

Sassy bark is taken from the trunk and larger branches. The specimens last sent by Dr. McGill are from a younger tree than those first received. The former was in pieces from four to ten inches long, all more or less curved, and exhibiting the mark of the knife at the ends, with some indication of dried sap on the cut surface, and about four lines thick. The exterior is slightly fissured longitudinally, and has lichenoid matter attached. The older bark has the epidermis removed in most of the pieces, and has a dark brown ferruginous color. The internal structure of the bark it

* In the figure there are several defects committed by the artist. The bark should be grey colored with light colored dots, the leaflets should have been rather larger in proportion to the petiole. The large leaves spoken of in the text are attached at the base of the shoots to which the leaves are attached in the figure.

a, Sassy bark tree. *b*, *c*, *d*, Legume and seed. *e*, Section of the bark.

quite peculiar. A smooth transverse section (*e*) exhibits numerous round, fawn-colored spots, surrounded by a reddish-brown cellular tissue. These spots are sections of cylindrical bodies, varying from one-half to two lines long, compact, brittle and very dense, sinking rapidly in water, and are most numerous in the oldest bark and near the inner surface. The spec. grav. of the bark in mass, according to Santos, is 1.054. Sassy bark has a slight not very marked odor, and an astringent taste, without bitterness. This astringency, which is due to tannic acid, resides exclusively in the reddish colored portion, a fact easily shown by applying with a camel's hair brush, a dilute solution of sesquichloride of iron, to a transverse section. The fawn-colored spots will remain intact while the surrounding tissue is dyed deep black. Sassy bark breaks with an abrupt fracture, and is readily disintegrated. The dust, when inhaled by the nose in the act of powdering, causes long continued spasms of sneezing, occupied with distress about the forehead and eyes.

Chemical Examination of Sassy Bark.—It is stated in the works of systematic botanists that the secretion of tannin and gum is a marked feature of that portion of the Leguminosæ included in the *sub-order* Mimoseæ, of which the Acacias may be quoted as an example. The intermediate *sub-order* Cæsalpineæ is also largely characterized by species abounding in tannin, of which the Hæmatoxylon may be instanced. The sassy bark tree is largely tanniniferous, and the bark might be used for tanning purposes in its native country. Gum does not exist largely in the bark, but, as has been said, is found in and around the seed; and as it is probable that the gum-bearing character of the Acacias may be due more to disease, or to an interruption of the normal condition of the circulation of the trees by punctures or incisions, than to an overflow or superabundance of that principle; the comparative absence of gum from sassy bark is no reason why it should not rank in that sub-order.

A thousand grains of the bark, in powder, moistened with water, was put into a glass percolator, and half a pint of strong infusion obtained by pouring water slowly on the bark. This was set aside, and the additions of water continued during two days, until the fluid passed tasteless and colorless. The residue dried at the temperature 90°—100° F., weighed 840 grains

The clear infusion had a dark red color, and was not coagulated

by heat. Sesqui-chloride of iron caused a flocculent precipitate of a greyish black color. Neutral acetate of lead, proto-chloride of tin, bichloride of mercury, and sulphuric acid, produce copious precipitates, and a solution of gelatin, affords a flocculent deposit. These tests indicate *tannic acid* in abundance; but its reaction with the persalts of iron and tartar emetic, the latter causing only a slight opalescence, indicate one of the modified forms of that acid.

When the tannin was removed from the infusion by gelatin in excess, and the liquid filtered, sesqui-chloride of iron caused a black coloration, which disappeared by heat. When the infusion was treated with a solution of neutral acetate of lead to remove the tannin and coloring matter, the filtered liquid afforded but a slight precipitate with subacetate of lead, indicative of but little soluble gum.

The residue of the sassy bark, after exhaustion with cold water, was boiled in water, and the transparent decoction filtered hot. As it cooled, a deposition of brownish red apotheme occurred, which was soluble in diluted alcohol and alkaline solutions, had but little taste, and that slightly astringent, due perhaps to a little unaltered tannin adhering, as it was colored blackish brown by sesqui-chloride of iron. This altered tannin exists in considerable quantity, as will be shown in a following experiment.

The cold decoction was not colored blue by solution of iodine.

The dried residue of the sassy was then exhausted with cold alcohol by displacement, yielding a dark kino-colored tincture, from which water precipitated a reddish brown substance. This tincture was evaporated to dryness, the residue reduced to powder, and a portion exhausted by chloroform, which left a brown residue soluble in alkaline liquids and diluted alcohol. The chloroform solution by evaporation deposited a mixture of fatty matter and resin both in small quantity.

Five hundred grains of the bark in powder was displaced with commercial ether, so as to obtain six fluid ounces, and the tincture evaporated to dryness spontaneously. This extract, which had a deep red color, was nearly all soluble in alcohol .835. It was treated with cold water, which softened it, dissolved out the tannin, and acquired a reddish color. The extract was malaxated with repeated quantities of water until it ceased to lose weight. The residue was boiled in repeated portions of water till it was exhausted by that menstruum. The residue was soft and fusible at 212° F.,

had little odor, was soluble in alcohol, and burnt with a sooty flame, with a large carbonaceous residue. This was then treated with chloroform by trituration and thrown on a close filter; the larger part was dissolved, forming a light brown solution, which yielded a soft, brownish, matter by evaporation. This substance fused by a gentle heat, caused a greasy stain on heated paper, and was dissolved by warm solution of potassa, from which muriatic acid precipitated it in minute brownish globules, and is a mixture of resin and fatty matter. The undissolved portion left on the filter was apotheme, dissolved by the alcoholic ether fisrt used. It was a brownish red powder, soluble in alcohol, insoluble in anhydrous ether and cold water, but dissolved partially by boiling water, and by solution of potassa, and swells up without disposition to inflame when heated.

The residue of bark left by the ether was extracted with alcohol, and this evaporated to dryness. This extract was exhausted with water and dried. The residue was completely insoluble in chloroform, swelled up when heated, was partly soluble in boiling water, very soluble in diluted alcohol and in alkaline solutions, and consisted almost wholly of a substance allied to the apotheme of Krameria triandra.

3500 grains of sassy bark in coarse powder, was exhausted by alcohol, .835 by maceration and percolation, and the tincture evaporated on a water bath to a soft extract, weighing 950 grains, which was used as the basis of a series of experiments for the active principle.

a. 200 grains of alcoholic extract of sassy was triturated with 120 grains of calcined magnesia, and sufficient water to effect the combination of the tannin and coloring matter with that earth, and then dried at 212°. The mass, reduced to powder, was exhausted with boiling alcohol, and the liquid evaporated to half an ounce and set aside. As the liquid disappeared by spontaneous evaporation, an oil-like matter separated on the sides and surface.

b. 200 grains of the same extract was treated in the same manner with 200 grs. of lime, previously hydrated. As the alcoholic liquid evaporated, the same oily-looking matter was eliminated.

c. 200 grains of the extract was treated with 100 grains of hydrated protoxide of lead, (carefully freed from alkali by washing) in the same manner as *a.* and *b.* and on evaporating the alcoholic liquid the same product was obtained.

This substance is very soluble in alcohol, soluble in ether and chloroform, and but slightly soluble in water. Its alcoholic solution slowly restores the color of reddened litmus, but when heated with very dilute hydrochloric acid, it was not dissolved. Its solution in boiling water afforded a curdy precipitate with tannic acid. When heated to redness on glass or platina, a minute ash of white color remains, which is alkaline in its action on moist reddened litmus. It has little if any odor or taste, and a grain of it given to a cat, produced no poisonous effect, and consequently it is not the active principle. An analogous experiment of Mr. Santos (Am. Jour. Pharm. vol. xxi. p. 100,) yielded him "a few grains of a crystalline matter, having a white colour and nauseating taste," which the paragraph following states was poisonous when tried on animals.

200 grains of the same alcoholic extract was triturated with half a pint of water, filtered, and the clear reddish brown solution filtered and refiltered through a layer of purified animal charcoal, previously boiled in alcohol. The charcoal was then washed, dried, treated with boiling alcohol, and this evaporated. A reddish brown amorphous residue was left without any indications of crystals, as obtained by Mr. Santos when a weak tincture was thus treated.

5000 grains of the bark in powder was exhausted with cold water by maceration and displacement, the coloured astringent infusion precipitated with subacetate of lead, and the excess of lead removed from the colourless liquid by sulphuric acid carefully added. The filtered liquid was evaporated on a water bath; before acquiring a syrupy consistence tufts of crystals separated, which were removed and set aside. The evaporation was continued and the residue treated with boiling alcohol, which on evaporation yielded a brownish, syrupy, deliquescent substance, exhibiting no disposition to crystallize. A portion of this given to a cat produced no symptoms of poisoning.

The crystalline matter which consists of sulphate of lime and an organic salt of lime, has not been sufficiently examined.

From the foregoing observations it is apparent that neither of the substances described is the active principle. I am convinced that when isolated it will be found to possess great activity, as three grains of the aqueous extract of sassy, given to a cat, caused violent poisonous symptoms, great prostration, frothing at the mouth,

moaning, dilatation of the pupils, and total indisposition for food. Another series of experiments are now in course, the results of which will be tested physiologically; but as they cannot be concluded in time for this essay, they will, if successful, form the subject of a future communication.

The organic substances detected are tannin, an insoluble apotheme analogous to those in Krameria, and a combination of these, which constitutes the red coloring matter of the bark, gallic acid, gum, resin in small quantity, fatty matter, and a peculiar matter precipitable by tannin, and soluble in alcohol and chloroform, but which is not the active principle.

Inorganic constituents of Sassy bark.—2000 grains of the bark in small fragments, was charred and partially incinerated in an earthen crucible, and the incineration afterwards completed in a platina crucible, using a green glass rod to stir the contents occasionally. Sixty grains, or three per cent. of a light colored grey ashes resulted.

The ashes were treated with boiling distilled water in successive portions till exhausted; the filtered lixivium, which was alkaline to test paper, yielded by evaporation 3.6 grains of a white amorphous residue. This was dissolved in water, neutralized with nitric acid, which caused effervescence, and filtered.

The clear solution afforded no precipitate with ammonia, potassa, or their carbonates, oxalate of ammonia, ferrocyanuret of potassium, hydrosulphuret of ammonia, or with phosphate of soda and ammonia.

When a portion of the solution was evaporated, it yielded crystals of nitrate of potassa. A solution of tartaric acid caused the gradual production of a white crystalline precipitate of bitartrate of potassa, and bichloride of platinum a yellow one in octohedrons.

Nitrate of silver threw down a white precipitate, soluble in ammonia, and nitrate of baryta a white dense one insoluble in nitric acid.

The soluble portion of the ashes therefore contains, *carbonate and sulphate of potassa, and chloride of potassium*, without lime, magnesia or iron associated.

The portion of the ashes insoluble in water, was treated with diluted muriatic acid, which dissolved nearly all with violent effer-

vescence, and then evaporated to dryness. The dry mass was treated with boiling distilled water thrown on a filter, the greenish grey residue washed with distilled water, and the washings added to the first liquid, which was perfectly colorless. This was divided into two parts and one set aside.

This solution when much diluted, was not precipitated by caustic ammonia or potassa, but when not diluted, these reagents and their carbonates produced abundant white precipitates. Phosphate of soda caused a bulky white precipitate, soluble in muriatic acid. Oxalic acid and oxalate of ammonia each produced white granular precipitates soluble in nitric acid. Sulphuric acid caused no precipitate in the dilute solution, but an abundant crystalline one when stronger. All the tests indicated lime in abundance.

When the lime was separated by muriate and carbonate of ammonia, the filtered solution yielded no precipitate with phosphate of soda and ammonia. Chloride of barium caused no change. Hydrosulphuret of ammonia produced a slight black precipitate and ferrocyanuret of potassium, after standing a while, caused a slight white deposit, but no evidence of iron.

The reserved half of the solution obtained from the ashes, was then treated with an excess of solution of oxalic acid, and after the deposition of oxalate of lime ceased, it was collected, washed, dried, and ignited at a dull red heat, and the resulting carbonate of lime was found to weigh twenty-one grains, equal to forty-two grains from the whole of the bark treated, or about two per cent. It is probable that the greater part of the lime exists in the bark in combination with a vegetable acid as the ashes, which were obtained by gradual incineration, at a comparatively low temperature, contained the lime as carbonate. A portion of the lime probably exists as phosphate.

The portion of the ashes left on the filter after treatment with diluted muriatic acid and distilled water, was heated in strong muriatic acid, which dissolved all but a little silica and grit, and acquired a greenish yellow color. This solution when diluted, gave evidence of iron by ferrocyanuret of potassium. It was then boiled with acetate of soda and acetic acid, and the gelatinous precipitate of the phosphate of iron dissolved in muriatic

acid and heated with an excess of potash, by which the iron as sesqui-oxide, was precipitated. The liquid left afforded no precipitate of alumina with an excess of acetic acid.

The insoluble portion of ashes consists chiefly of carbonate and phosphate of lime, phosphate of iron, and silica, without magnesia or alumina.

ON LIQUOR FERRI NITRATIS U. S. P., 1850; AND ON A FORMULA FOR SYRUP OF PROTO-NITRATE OF IRON.

By William Procter, Jr.

The instability of the so called "solution of sesqui-nitrate of iron" is proverbial, and several attempts have been made to render it sufficiently permanent, to be at all times relied on. The formula of the Dublin Pharmacopœia of 1850, which is virtually that of Mr. Kerr of Scotland, has been adopted in the United States Pharmacopœia, with a slight alteration, rendered necessary by the different value of the weights and measures of the two codes. The manipulation is the same, viz., to dilute the acid with about five times its bulk of water, and add it to the iron at once, leaving them in contact until the reaction ceases, which is usually stated at twelve hours. The solution thus prepared, has, after filtration and dilution, a dark reddish brown color, and is precipitated black by ammonia, which indicates clearly that the iron is not entirely sesqui-oxidized, and that the solution is a mixture of the proto and sesqui-nitrates of iron.

When this solution is suffered to stand, either in close or open vessels, it gradually becomes opaque, and deposits an ochreous sediment, which ceases after a length of time, whilst the liquid has acquired a much lighter color, is transparent, and is precipitated in brownish red flocks by ammonia, without any admixture of black. The ochreous precipitate is probably a basic, or sub sesqui-nitrate, several of which are known to exist, and one of which, according to Grouville (Gmelin's Hand b; vol. v., p. 269,) has the formula $4\,Fe_2\,O_3,\,NO_5+2HO$. The proportion of this subsalt that will precipitate from the officinal solution, depends

on the proportion of proto-nitrate existing in the preparation when filtered from the excess of iron, it being greater as the amount of the proto-salt is greater. If the solution is filtered off from the excess of iron as soon as the reaction has ceased to be active, it will contain much less of the proto-nitrate, than if the contact continues for a length of time (12 hours). The reason of this appears to be, that a portion of iron is oxidized, and dissolved at the expense of the acid of the ter-sesquinitrate, reducing a part of that salt to the condition of an insoluble subnitrate, which salt is subsequently increased in quantity at the expense of the proto-nitrate, by its gradual conversion into ter-sesqui-nitrate, which remains in solution, and sub-sesquinitrate which precipitates.

If, however, instead of proceeding according to the officinal directions, the nitric acid is diluted to the sp. gr. 1.15 and the iron, in the form of iron wire, as card teeth, be gradually added, so that the active reaction nearly ceases after each addition, till it is saturated, and then filtered, a solution is obtained containing a much smaller proportion of the proto-nitrate. If now this is heated gently, and nitric acid is slowly dropped in, stirring after each addition until the solution yields a reddish brown precipitate with ammonia, the solution is entirely free from the proto-nitrate, and has a much lighter color. The slight excess of nitric acid that exists in the solution thus prepared, is, therapeutically considered, probably an advantage. Dr. Bache, (U. S. Dispensary, 9th edit., page 1008,) suggests that "a permanent solution might be prepared by dissolving moist hydrated sesqui-oxide of iron in nitric acid to saturation." This suggestion, however correct in theory, is not easily practised, because, after sufficient of the oxide is dissolved to form a true ter-nitrate, the dissolution of the oxide continues until a large portion of sub-sesqui-nitrate is formed, and unless the exact proportions of acid and base are used, the operator has no clue to guide him in the process.

The following modification of the officinal direction is offered as yielding a true sesqui-salt in solution, and of equal strength with that of the Pharmacopœia:

Take of Iron Wire (card teeth) cut in pieces, an ounce.
Nitric Acid (sp. gr. 1.42) three fluid ounces;
Distilled Water, a sufficient quantity.

Mix the acid with ten fluid ounces of the distilled water in a thin wide mouthed bottle, which should be surrounded by water. Add the iron gradually, about a drachm at a time, waiting until active effervesence has ceased after each addition before making the next. When all the iron has thus been thrown in, filter the solution through paper, heat it gently in a capsule or flask, and carefully drop in nitric acid followed by stirring or agitation until a drop of the solution tested with ammonia yields a red precipitate without any tinge of black. Then add distilled water until the liquid measures thirty fluid ounces. The solution should have a bright madeira wine color.

In a paper by Mr. Augustine Duhamel (Amer. Journ. Pharm., vol. xvii, July 1845,) the author states that Dr. Hays (of Philadelphia) has been using a saccharine nitrate of iron for several years. In a recent conversation with Dr. Hays, he informed me that the preparation he uses is a syrup, and does not spoil by keeping, and that it is prepared by Mr. Samuel Simes, to whom he (Dr. Hays) first suggested the protective agency of sugar in reference to nitrate of iron. All who have made the syrup of sesqui-nitrate of iron of Duhamel, are aware that it will not keep long, and a specimen in my possession exhibits nearly the whole of the iron as a precipitate. On examining Mr. Simes' preparation, it was found to be a thick syrup of a light greenish color, perfectly transparent, neutral and to yield a greenish colored precipitate with ammonia. These characters at once prove the iron to be chiefly in the form of a proto-salt protected by sugar. As Mr. Simes declines to communicate his formula for publication, and as the testimony of Dr. Hays is strong in favor of its therapeutic value, I offer the following receipe for making the preparation.

It requires a particular course of manipulation to dissolve iron in nitric acid, without a large portion passing to the higher stage of oxidation. If, however, instead of adding the iron in divided portions to the nitric acid, we add the nitric acid, more diluted, to the iron in great excess, the acid gradually becomes saturated, the solution has a light greenish color when filtered, and is precipitated of a greenish color by ammonia. It is necessary for the solution to stand on the iron for several hours after the last addition of acid.

Take of Iron Wire (card teeth) in pieces, two ounces.
Nitric Acid (sp. gr. 1.42) three fluid ounces.
Water, thirteen fluid ounces.
Sugar, in powder, two pounds.

Put the iron in a wide mouthed bottle kept cool by standing in cold water, and pour upon it three fluid ounces of water. Then mix the acid with ten fluid ounces of water, and add the mixture in portions of half a fluid ounce to the iron, agitating frequently until the acid is saturated, using litmus paper. When all the acid has been combined, filter the solution into a bottle containing the sugar and marked to contain thirty fluid ounces. If the whole does not measure that bulk, pour water on the filter until it does. When all the sugar is dissolved, strain, if necessary, and introduce the syrup into suitable vials and seal them.*

SYRUP OF PROTO-NITRATE OF IRON.

By W. W. D. Livermore.

Syrup of proto-nitrate of Iron is an improved form, in which the officinal Liq. Ferri Nitratis is at present prescribed by several prominent physicians in this city; and combining as it does the advantages of the proto-salts of iron, with stability of preparation, is destined to come into general use as an active and pleasant ferruginous remedy. I believe no formula for it has yet been published, and as apothecaries have found it both inconvenient and disagreeable depending upon others to prepare it by some secret recipe, the subjoined may be found a convenience.

℞. Sulphate of Iron, ℥viii.
Carbonate of Soda ℥x.
White Sugar, ℥xx.
Nitric Acid, (sp. gr. 1.42) f.℥v. and f.℥v.
Boiling Water,
Simple Syrup, *aa.* q. s.

* This paper was written and read before the Philadelphia College of Pharmacy, before Mr. Livermore's paper, following, was received—but as the same result is arrived at by different processes, both are inserted.—Ed.

Dissolve the sulphate of iron and carbonate of soda, each in two pints of the water, filter, and add to each solution two ounces of simple syrup. Mix the solutions, and allow the precipitate to subside. Pour off the supernatant liquid, and wash the precipitated carbonate carefully with sweetened water, until the washings have no longer a saline taste. Collect the precipitate upon a fine muslin strainer, and with gentle pressure express as much of the water as possible. Transfer to a porcelain capsule, and add gradually the nitric acid, previously diluted with an equal measure of water. Mix the sugar with the solution, and dissolve over a water bath, stirring from time to time with a glass rod. When done, the syrup should be made to measure thirty fluid ounces, by the addition of a sufficient quantity of water.

It does not always happen that the apothecary has on hand an acid of known specific gravity, and when this is the case, it will answer to add nitric acid diluted with an equal measure of water to the carbonate of iron, until dissolved, and the solution possesses a slightly acid reaction.

This syrup contains ten grains of dry nitrate of iron, to each fluid drachm, and the dose varies from twenty to forty drops.

MEANS OF DETERMINING THE PURITY OF CERTAIN CHEMICALS AND DRUGS, AND FOR DETECTING ADULTERATIONS.

(Continued from page 106.)

Carbonate of Potassa, in its medicinal form, is a white granular powder, inodorous, and of an acrid alkaline taste, dry and not adhering to the sides of the bottle, and an alkaline reaction; very deliquescent, soluble in its own weight of water, insoluble in alcohol. At a red heat it loses sixteen per cent. of water, but no carbonic acid, and fuses into a transparent liquid. With acid it effervesces rapidly. The impurities generally present are chloride of potassium, sulphate and silicate of potassa.

Chloride of potassium is detected by supersaturating a solution of the salt with pure nitric acid, and adding nitrate of silver; a

white cloud indicates the presence of chlorine. The sulphate, by supersaturating as before, and adding solution of chloride of barium, sulphuric acid being present, a white precipitate will fall. If the solution of carbonate be very strong, a white precipitate may form on adding solution of nitrate of silver, which will disappear on dilution; this is also an indication of sulphuric acid, but not to be relied on without confirmation.

Silicate of potassa is indicated when a solution of the carbonate lets fall a gelatinous precipitate on exposure to the air. It may be detected by saturating the salt with pure muriatic acid, evaporating to dryness and heating to redness; silicic acid is left as an insoluble residue when the mass is acted on by water. The silica frequently exists in such an amount as to form a gelatinous precipitate when the salt is supersaturated with any acid. *Potassæ carbonas* should give indications with all the above tests, but not very decided. *Potassæ Carbonas Purus*, no effect. This latter salt may give indications of silicic acid when it has undergone deliquescence in a white glass bottle, from dissolving some of the silica of the glass.

Bicarbonate of Potassa.—A colorless crystalline solid, with a slight alkaline taste and reaction, with vegetable yellows. Soluble in four parts of cold water, but insoluble in boiling water without decomposition, carbonic acid being liberated; insoluble in alcohol. By a red heat it loses about 30 per cent., or all its water and half its carbonic acid. The impurities to be met with in it are sesqui-carbonate and sulphate of potassa and chloride of potassium. If sesqui-carbonate be present, a dilute solution will form a brick red or orange precipitate, with solution of corrosive sublimate; sulphate of potassa and chloride of potassium may be detected by the same means as in the carbonate.

Carbonate of Ammonia.—This salt is in hard translucent lumps of a fibrous crystalline texture; it has a strong, pungent, penetrating odor and a sharp permanent taste; its reaction is alkaline, and in consequence of the escape of a portion of its constituents, moistened tumeric paper immediately becomes brown when held over it. It is soluble in four parts of cold water, but hot water decomposes it with effervescence, carbonic acid being liberated; partly soluble in officinal alcohol; in boiling alcohol it dissolves, but also undergoes the same change as in boiling

water. It is totally volatile by the temperature of a water bath. Exposed to the air or kept insecurely, it decomposes readily, losing ammonia and carbonic acid, becoming opaque, lighter, and finally, a white crumbly mass of bicarbonate. This change occurs so easily, that when imported in stone-ware vessels not well glazed, it has become much injured. It is generally sufficiently pure for medicinal use, containing only traces of tarry matter, which gives a dark color to its solution in acids, and leaves a brownish residue when the salt is evaporated on a water bath. It becomes less fit for medicinal use as it undergoes decomposition by exposure. No portion of the salt should be used for medicinal purposes except it be clear and translucent, all that is white and opaque should be rejected, or used for those purposes only (saturation of acid, &c.) in which an excess of carbonic acid is not important.

Carbonate of Lime.—This is officinal under three forms of different purity: *creta preparata*, *testa preparata*, and *calcis carbonas præcipitatus*, the latter introduced into the Pharmacopœia of 1850.

Prepared chalk and shell are in dull white friable lumps, inodorous and insoluble in water. Acted on by hydrochloric acid, diluted with four to six parts of water, it dissolves with effervescence, forming a copious froth which does not readily subside, and the liquid contains dirty gray flocculi. The filtered liquid, much diluted, produces a slight precipitate with caustic alkali, and a copious white precipitate with oxalate of ammonia. The prepared chalk is rarely adulterated, but if not well prepared may be gritty or dirty; when mixed with water and allowed to stand a few moments, on decantation no harsh residue should have subsided; the solution in hydrochloric acid should not have in it so much flocculi as totally to obscure its transparency. On account of the foliated texture of oyster shell, it is not readily reduced to fine powder, hence chalk is occasionally substituted for the shell. Burnt bone has been used to adulterate prepared shell; in this case, the solution in hydrochloric acid sometimes leaves a dark (nearly black) residue when filtered, and the filtered solution precipitates copiously with caustic alkalies.

Precipitated Carbonate of Lime.—This should be a pure white impalpable powder, tasteless, inodorous and insoluble in water; soluble in hydrochloric acid with effervescence, the bubbles break-

ing readily and soon subsiding; solution transparent and colorless. Not well washed it may contain chlorides of sodium and calcium, or carbonate of soda and chloride of sodium. Washed with water, the filtered liquid, if chloride of calcium be present, will produce white precipitates with solution of nitrate of silver and oxalate of ammonia; carbonate of soda will be indicated when the above liquid turns the yellow of tumeric to brown. It may also contain iron and magnesia. In this case its solution is hydrochloric acid, rendered nearly neutral by an alkali, will indicate iron by producing a greenish or blue color with ferrocyanuret of potassium. Magnesia may be detected by adding to the solution in hydrochloric acid (an excess of acid being used) carbonate of ammonia, filtering and heating the clear liquid to the boiling point, to drive off any carbonic acid which may hold carbonate of lime in solution, filtering again if necessary, and adding phosphate of soda. A crystalline precipitate gradually forms if magnesia be present.

If prepared chalk or shell be substituted for, or mixed with, the precipitated carbonate, the permanency of the froth and the undissolved flocculi will be sufficient to discriminate this imposition. Sulphate of lime is also said to be used as an adulteration; in this case, there will be a residue left after the action of the acid in varying amounts, very slightly soluble in water.

Carbonate of Magnesia is in light, white, spongy masses, smooth to the touch, inodorous, tasteless, and insoluble. Thrown into dilute muriatic acid, it dissolves readily, with effervescence, forming a clear solution. At a red heat it loses about 58 per cent of its weight. The impurities present, may be soluble or insoluble in water. The former, the alkaline chlorides, sulphates, and carbonates, may be detected by boiling some of the carbonate in water and testing the filtered liquid with nitrate of silver, which will afford a white precipitate, if the chlorides, chloride of barium, a white precipitate if sulphate, and solution of turmeric, which will become brown if carbonate of an alkali are present The insoluble impurities are alumina, lime and oxide of iron; its solution in hydrochloric acid yielding with ammonia added in such excess as to retain in solution all the magnesia; a gelatinous precipitate soluble in caustic potassa indicates alumina. The solution neutralized by ammonia, forms a white precipitate with oxalic

acid, and oxalates if it contains lime, and oxide of iron may be detected by nearly neutralizing the acid solution and adding ferrocyanuret of potassium, when a blue color will result.

Carbonate of Baryta.—The native carbonate of baryta, is officinal as a means of preparing chloride of barium. It is in yellowish fibrous masses, somewhat translucent; insoluble in water; soluble in muriatic acid with effervescence, leaving no residue. It may contain sulphate of baryta and carbonates of strontia and lime. The former will be left as a heavy insoluble residue after the action of muriatic acid; strontia will be detected by evaporating the solution in muriatic acid to dryness, and adding alcohol; on setting fire to the mixture, a red edge to the flame will be given, although the quantity of strontia present may be small. If lime be present, sulphuric acid in excess will precipitate all the baryta from the solution in muriatic acid, when the addition of solution of carbonate of soda will throw down a white precipitate of carbonate of lime, especially if the solution be raised to boiling point, to ensure the absence of an excess of carbonic acid. In the form of powder, it may contain sulphuret of lead, with which it is associated as a mineral; the muriatic acid will cause the evolution of the sulphuretted hydrogen, and sulphuretted hydrogen will produce a black precipitate when passed through the solution; solution of ammonia also produces a white precipitate not soluble in an excess.

Carbonate of Zinc.—Officinal under two forms, *Calamina* or impure native carbonate, and *zinci carbonas præcipitatus.*

Calamine, as intended in the Pharmacopœias, is that variety of the mineral which is composed chiefly of carbonate of zinc. It is when prepared in fine powder, varying in color from yellowish white to brownish yellow. In its purest form, it is totally soluble in diluted sulphuric acid with effervescence; generally it leaves an insoluble residue, derived from the adhering matrix. As for convenience of powdering, it is heated red hot, the effervescence is not great, on account much of the carbonic acid having been driven off. The solution produces a gelatinous precipitate with ammonia, nearly all soluble in an excess.

This article is commonly adulterated, or more properly spurious mixtures are substituted for it, to such an extent, that it is difficult to obtain a preparation under this name, containing any zinc. The factitious mixture generally contains sulphate of barytes, carbonate

of lime, alumina, oxide of iron, &c., and varies in color from yellowish brown to pinkish brown of different shades. Mr. Jacob Bell is of the opinion that spurious Calamine is not a factitious article, but is the mineral known to the English miners as *Baryta Calamine* in contradistinction to the true *Brass Calamine*, which is really amorphous sulphate of baryta colored with oxide of iron. (*U. S. Dispensary*, 9th edition, page 1279.) Acted on by dilute sulphuric acid it effervesces, and the cold solution after filtration, affords sometimes, only a brown flocculi of oxide of iron, at others, a gelatinous precipitate with ammonia, insoluble in an excess. Heated to boiling before filtration, the filtered solution in cooling deposits crystals of sulphate of lime. Dissolved in hydrochloric acid, the odor of sulphuretted hydrogen is sometimes evolved, and the residue is less in quantity than with sulphuric acid. From this solution carbonate of ammonia throws down a precipitate of a light brown hue, not redissolved by an excess.

Precipitated Carbonate of Zinc.—A very white powder soluble in acids with effervescence; its solution in diluted sulphuric acid acts as pure sulphate of zinc. Its accidental impurities are iron, copper and cadmium, derived from the sulphate, and may be detected as in the sulphate. It is adulterated with carbonate of lime. It is then but partly soluble in dilute sulphuric acid, and its solution in hydrochloric acid gives a precipitate with carbonate of ammonia not soluble in an excess.

L'OFFICINE (THE SHOP,) OU RÉPERTOIRE GÉNERAL DE PHARMACIE PRATIQUE, par Dorvault, Paris 1850.

We have just received from the author a copy of the third edition of this valuable work, which embodies, in a single volume of 982 pages of two colums each, all the information wanted by the Pharmaceutist in his shop practice.

From a perusal of the work, we are induced, strongly, to recommend it to the attention of such of our colleagues as are acquainted with the French language. They will find in it, besides practical information of every sort, hitherto of difficult access, a general dispensatory and formulary, with polyglot synonyms, which

cannot fail being exceedingly useful. Such a work may be said to be a cyclopædia of Pharmacy and its accessory branches, which, in a single volume, will afford the condensed matter of a pharmaceutical library.

" L'officine," in the words of Mr. Dorvault, " is not a scientific work; but one of more modest pretensions; it is a work of patience! Pharmacy as a science, had already been enriched by men of talents and reputation, with numerous treatises embracing, some, all the branches in a general point of view; others, limited to special subjects; but practical pharmacy, or in other words, the *pharmacy of the shop*, did not possess as yet a single work, in which could be found, collected together in a suitable form, all the various and numberless kinds of information that are indispensable in the shop practice."

It is with a view to supply this deficiency, that Mr. Dorvault ably and industriously exerted himself in collecting together, so as to form a complete ensemble, all the useful matter that could be found disseminated in numerous special works, or were suggested by his own experience. How far he has succeeded in his undertaking may be inferred from the fact, that the first edition of the Officine was brought forth in 1844, and the third in 1850.

A work so obviously useful, and so extensive in its various subjects, could not attain its aim, unless all its parts were arranged in a methodical form, of easy and prompt access to the inquirer. This, the author has endeavored to realize, by dividing the work in different parts. The first, headed *Prolégoménes*, contains all the information particularly required for the proper understanding of the matters that are treated in the succeeding divisions. It contains 56 pages embracing the following subjects, viz.

Weights and Measures, or a full exposition of the French decimal system, with a good notice of European weights and measures, and a table of their respective value compared with the French decimals.

Hydrometers and Thermometers.—Their description, with rules for rendering the different scales; tables of specific gravity; tables of concordance of the three principal thermometers; tables of the points of fusion, ebullition and dilatation of the different bodies; and tables of frigorific mixtures.

Selection of simple drugs, in which is given the period most

appropriate for collecting plants or their parts, so as to gain, most effectually, their medicinal virtues; a tabular calender of the seasons at which they are collected; their desiccation, preservation, &c.

Succedaneus or analogous remedies, giving the analogy of the properties of plants of the same family, and, to a certain extent, a means of substituting one for the other, when necessary.

Scientific classification of plants and animals, treated in a tabular form.

Pharmaceutical classification and nomenclature.—Being an exposition of the several attempts that have been made by Beral, Chereau, and Henry and Guibourt, to form a scientific classification and nomenclature of remedies.

Therapeutic classification of remedies, useful both to the physician and the pharmaceutist.

L'art de formuler, or the philosophy of writing prescriptions therapeutically and pharmaceutically correct.

This chapter, and the following, entitled "*Execution of Prescriptions*," cover twenty-four pages, and are full of interesting details. They form, in themselves, a complete treatise on the particular branch of writing and executing prescriptions, worthy of an entire republication, if the limits of this journal permitted it; but we shall confine ourselves to a few quotations:

"The art of prescribing," says Mr. Dorvault, "is the application of the knowledge acquired in Chemistry, Pharmacy, Therapeutics, and in the physical and natural sciences. Therefore, in order to practice this art successfully, it requires a profound and diversified knowledge, united to qualifications almost innate, a perfect tact and sound judgment. Indeed, it may be asserted without any hesitation, that the art of prescribing is the criterion of medical ability, and the prescription is the end and object of medical studies, and the test of qualifications for practising medicine. A learned anatomist, a profound physiologist, one deeply versed in most medical sciences, in pathology itself, may be a scientific man; but he cannot be pronounced a Physician, if he be ignorant of the rules of this art."

This chapter, more particularly addressed to the practitioner, is intended to point out the best modes of associating drugs in extemporaneous recipes. The author treats of the subject under several

sections, viz: *Inscription*, or determination of the components; the relative quantities of these and the order of their arrangement in the prescription. It consequently involves Therapeutics, to fit the remedy to the disease, Chemistry, to avoid incompatibles, and Pharmacy, to determine the excipient and adjuvant best appropriated for the active base. *Subscription*, or the *modus faciendi* that is to govern the pharmaceutist in compounding it. *Instruction*, or directions to the patient or nurse relative to the administration of the medicine when completed.

Incompatibility is considered under three heads: Physical, Physiological and Chemical incompatibility.

All this chapter of the Officine might well form the subject of an interesting lecture in our medical schools. We highly recommend it to the particular attention of our young practitioners, who generally prove themselves more or less deficient in this branch of their science. We might, perhaps, without any impropriety, extend the advice to a few older physicians, whose unscientific prescriptions occasionally cause among us a good deal of perplexity, and excite the smiles even of our apprentices.

Execution of Prescriptions. The preceding article concerns, principally, the physician; this is wholly addressed to the pharmaceutist:

"We have established as a principle," says M. Dorvault, "that a judiciously written prescription ought to exhibit the different substances therein specified, in the order in which they are to be mixed. Should the physician have neglected to do it, it is the duty of the pharmaceutist mentally to re-establish this order, when he executes the prescription. In ordinary cases, the execution of a formula, in itself, is a very simple process; yet it is only by a long experience that the pharmaceutist becomes qualified to solve all the cases that may occur."

"Before proceeding to the execution of a formula, he will take care to read it with attention, and should he discover, or presume he discovers, any error which might endanger the health of the patient, he should take care, (for the sake of the physician who owes him a reciprocal regard,) not to show any embarrassment to the bearer of the prescription. Alleging as an excuse, that the medicine requires some time to prepare, he should request him to call in one or two hours, and should take advantage of this inter-

val to call on the practitioner and advise with him. Otherwise, unless the error be startling, and the physician not to to be found, he should put up the prescription without any alteration; or if any be made, he should not fail afterwards to inform the physician of what he has done." In this respect, Mr. D. adopts Mr. Veé's opinion in preference to that of Mr. Bouchardat, who maintains that in no case a pharmaceutist has a right to alter the prescription of a physician.

In order to save hesitation and anxiety to the pharmaceutist, and sometimes an unpleasant feeling between physician and pharmaceutist, Mr. Dorvault proposes that, every time a large dose of an active medicine is prescribed, it shall be stated, first in the ordinary figures of weights and measures, and then repeated in full writing on the margin or at the foot of the prescription.

"As it is granted that the practitioner calculates on the good quality of the medicine which he prescribes, his task is, as it were, accomplished the moment he has written his prescription. He, as well as the patient, rests in confidence on the ability and the uncontrolled honesty of the pharmaceutist. If the latter feels the importance and gravity of his office, he will know how to appreciate the obligation imposed on him by this implicit confidence, of which he should endeavor to render himself worthy by the most scrupulous attention and fathfulness in putting up the prescription. He should never, of his own accord, substitute one article for another, through neglect, or with a view to a sordid interest."

"The substitution of one medicine for another, may give rise to grievous consequences. It is calculated to deceive the practitioner as to the action of remedial agents, to confuse his former notion of materia medica, or induce him to suspect his own diagnosis."

"The curtailing of the dose of an article prescribed by the physician, having for its object an illicit profit, may be productive of still more calamitous consequences. Let us suppose, for instance, that an article prescribed in a rational dose, be curtailed by the faithlessness of the pharmaceutist, and thus fail to produce the desired effect; the physician, naturally ascribing the failure of his medicine to the insufficiency of the dose, will increase it successively, until he arrives at a toxical dose. Let us suppose then, that the same prescription be sent to another store

where it will be faithfully executed; it will follow that this latter prescription may prove a poison. We repeat it again, the pharmaceutist cannot, *proprio motu*, substitute one remedy for another, nor alter the dose prescribed by a physician, without incurring fearful consequences."

A table of abbreviations and symbols in pharmacy, terminates and completes the first part of the Officine.

The second part, headed *Pharmaceutical Dispensatory*, occupies 542 pages. It is an alphabetical description and arrangement of the simple substances used in medicine, and of the preparations derived from them, which is exceedingly comprehensible as to materials, but, sometimes, deficient in details, from the nature of the work, which does not admit of long descriptions. The history of a substance is always followed by the indication of its medical virtues, its dose and its incompatibles, whenever it is necessary. Salts are arranged under their acids, as acetates, carbonates, sulphates, &c., instead of their bases. Pharmaceutical compounds are placed in classes, as cerates, plasters, syrups, tinctures, &c., the several constituent drugs being inscribed under their respective heads. The information contained in this department of the work is exceedingly diversified. It is, at once, a treatise of materia medica, of practical pharmacy, and a general formulary. A few ill executed woodcuts are interspersed through these pages. The articles Extracts, Mineral waters, Leeches, Syrups, among others are pretty fully treated.

All the simple articles of any importance have the synonyms in several foreign languages, immediately under their scientific name, and a polyglot table at the back of the work affords a ready means for foreigners to consult the book.

The third part of the *Officine* is devoted to *Legal Pharmacy*. It contains, 1st, the laws, decrees, ordinances and police regulations relative to Pharmacy in France. 2d, A *treatise on Toxicology*, including a classification of the poisons; an indication of the symptoms produced by their introduction into the system; the means calculated to counteract their deleterious effects, and finally the reagents by which their character can be detected. 3d, It contains also a *pharmaceutical essay* by which the pharmaceutist may be enabled to test the purity of pharmaceutical products, and ascertain the falsification of the simple and compound medicines,

as well as the adulteration to which even alimentary substances are, occasionally, subjected to.

The two last divisions of this chapter are exceedingly valuable, and the matter condensed in them sufficiently comprehensible for all purposes. With the latter, the pharmaceutist will be enabled to ascertain the purity and genuineness of the drugs he purchases. With the other, he may, in a short time, place himself in a position to afford assistance in cases of poisoning, either by direct interference in the absence of a physician, or by assisting the practitioner in his difficult task.

Under the head of *Pharmaceutical appendix*, the following 72 pages embrace a variety of subjects, viz.; *A formulary for veterinary practice;* An essay on *Homœopathic pharmacy*; Special points of information in *pharmaceutical chemistry; A table of chemical compounds* exhibiting their symbols, equivalents, densities, and solubilities in water and alcohol, arranged in vertical columns, which will prove exceedingly useful and convenient. This table of chemical compounds is, probably, the most complete extant in any book, and is well calculated to facilitate chemical computation, and the preparation of the compounds obtained by double decomposition. There are also essays on *chemical analysis* and on *pathological chemistry* exceedingly desirable. Pharmaceutists have frequent occasions to make researches on some points of analytical chemistry, which they are sometimes at a loss to perform for want of a proper guide. They may, at any time, be called upon to ascertain the composition of an alloy, of a mineral, of an arable soil, of a mineral water, &c., or, they may have to perform, at the request of some physician, analyses of morbid secretions, of bile, urine, &c. In this chapter, they will find information calculated to assist them in the solution of these diverse problems of analytical chemistry.

Then follows a *miscellany* of 18 pages, including many valuable suggestions and recipes accessory to the shop business; *Pharmaceutical economy*, or rules for governing the shop and laboratory; a chapter giving catalogues of medicines, instruments and appliances suitable for ship and country medicine chests, for assistance to drowned and asphixiated persons, and to the wounded on the field of battle, &c.; and lastly, a therapeutical reminder (*memorial therapeutique*) suggestive of the remedies used in dis-

eases, the names of the latter being arranged alphabetically, and followed by the reminder.

Following this appendix is a general tariff with blanks to be filled in with prices, analogous to our druggist's manual. An index of authors and the polyglot index before alluded to, conclude the *Officine* of Mr. Dorvault.

Such is the work which we have attempted to introduce to the notice of our colleagues, and which we recommend also to the attention of the medical profession. The industry of the author, in this undertaking, has been immense. He has thrown together an infinite amount of useful and well arranged matter, which will place the *Officine* among the most substantial works on practical pharmacy. As a whole, Mr. Dorvault's book may not have the same claims to a scientific treatise on practical pharmacy as that of Soubeiran; but such as it is, it will be found a most complete guide to carry on all the business of the shop, scientific and practical. It will, particularly, be useful in this country where the numerous foreign physicians, who have settled among us, are much in the habit of writing their prescriptions in their national nomenclature, or of prescribing preparations unknown to us either by name or composition.

We have, likewise, received another work of Mr. Dorvault, entitled *Iodognosie*, or a chemical, medical and pharmaceutical Monograph of Iodine and its compounds, published in 185[illegible]. This work of 300 pages has received two gold medals; one from the medical Society of Lyons in France; the other, from the Belgian Society of Sciences Belles Letters and Fine Arts. We have not had time as yet to examine the work thoroughly, but we have no doubt that this new production of Mr. Dorvault, so successfully crowned by two learned Societies, is deserving the attention of Physicians and Pharmaceutists. E. D.

"ECLECTIC PHARMACY."

By Edward Parrish.

Most of the readers of the Journal, especially those residing west of the Alleghenies, are aware that among the productions of the Nineteenth Century, is a certain class of medical philosophers yclept "Eclectic" or "Reformed" practitioners. The head-quarters of this sect appears to be in Cincinnati, where they have their principal school, and where also is published the "Eclectic Medical Journal," a monthly periodical of considerable pretensions, edited by Dr. Joseph R. Buchanan and Dr. T. V. Morrow, both professors, and Dr. David Shepard, "Corresponding Homœopathic Editor."

In the said Journal,* is an article entitled Eclectic Pharmacy, by W. S. Merrill, A. M. My attention was directed to this some months since, by a gentleman who desired me to prepare for him some concentrated preparations spoken of therein.

The author of the essay referred to, claims to be the discoverer of certain active resinoid principles, to a description of which, their mode of preparation, &c., the article is devoted.

They are obtained from the roots of Podophyllum peltatum, Cimicifuga racemosa, Sanguinaria canadensis, Leptandra virginica, Iris versicolor, and certain other roots, which are little used by regular practitioners.

This author proposes to call these principles by the generic name of the plant from which they are derived, with the termination *in*, resembling that of Resin, as in the case of the alkaloids the termination *ia* is adopted, resembling that of the alkalis proper.

This arrangement proposed by the writer as though original with himself, is in fact that adopted long since in standard works, and if followed by all writers and experimenters would be productive of great advantage. Upon this plan Jalapin, Piperin, Santonin, and many similar principles, are named, but in each case the name is applied to the resin in a state of purity.

The claim set up by this "Eclectic Pharmaceutist," that he is the discoverer of these resinoid principles, is the most curious feature

*Vol. II. No. 7, July 1850.

of the article in question. That our readers may see his argument as presented by himself, the following remarkable passages are quoted.

"It is often asked with respect to Podophyllin, Leptandrin, and other analogous preparations, am I the discoverer of these? I answer, I am so in the same sense that Fulton invented the steamboat, and Morse the electric telegraph. The power of steam and its application to machinery, was known before the time of Fulton, and it had even been applied to the propelling of a boat; but he carried these inventions *one step further*, and *first* made them of practical utility in navigation.

The properties of electro-magnetism, and even its power to produce mechanical motion, was known before the inventions of Morse. He only advanced a step on these discoveries and made them subservient to the important uses they now perform.

So of these medicines. Other pharmaceutists had partially examined the Podophyllum, the Macrotys, and several other of our indigenous medical plants, and had discovered that among other proximate principles, they contained one of a resinous character, and Mr. Lewis, of the Philadelphia College of Pharmacy, (whose analysis was probably previous to mine, although not published till afterwards,) announced that the resin of Podophyllum was a drastic cathartic in doses of six or eight grains. But these discoveries lay as dead facts in the records of science until, without a knowledge of any of them, I obtained these principles in a purer form, and by a more eligible process, and immediately tested their operation, and with the efficient co-operation of the professors, and other physicians of the Eclectic school by whom I am surrounded, established their character as among the most important agents of the materia medica."

After thus attempting to sustain the extraordinary claim he had set up to originality, the author proceeds to describe the method he adopts to obtain these resinoids.

"The process for procuring these is, in theory, very simple. It is in general to obtain a saturated alcoholic tincture of the root. To this add a large quantity of water, and distil off the alcohol. The watery menstruum holds in solution the gum, mucilage, extractive and most of the coloring matter, while the resinoid substance subsides, and is collected, washed and dried. Still the process requires in many points no little skill and pharmaceutical experience for its success.

The yield of these resinoids, from different roots, varies considerably, as might be expected, but the average of these principles is from two to four per cent., or from a half oz. to one oz. from the pound of powdered root.

In the manufacture of these medicines the price of the root is but a moiety of the actual cost. The grinding, the waste of alcohol, even with the most

perfect apparatus, and the labor and time employed, constitute the larger portion of the expense of production, so that the physician or even the druggist will seldom find it good economy to prepare for themselves."

From what has been quoted it will appear that this article is, in fact, an advertisement of the preparations of the said W. S. Merrill, A. M., designed to introduce them to the notice of Physicians and the trade, as his own, and intimating that they are prepared by a difficult process not conveniently resorted to by pharmaceutists generally. It is evidently intended, rather to discourage any attempts to prepare them, than to invite the co-operation of pharmaceutists by a candid and full detail of the process and its results.

This view is strengthened by a remark occurring somewhat farther on in the article, as follows:

"The cost of obtaining the pure resinoid principles from our different indigenous plants, varies considerably, according to the price of the material and the amount of yield, but for the sake of convenience we have fixed on one dollar per ounce, as the uniform price of them all, at present, with the usual commercial discount to those who buy in quantity to re-sell."

Now whatever may be our views of the propriety of this mode of advertising, as practised in a professedly scientific Journal, under the guise of contributing to the common stock of professional knowledge, it must be admitted that in this case it has been scarcely less successful than the more open quackery of certain other manufacturers of medicinal preparations.

These so-called resinoids have attained a very considerable sale, and from being used almost exclusively in the West, where they originated, have been introduced into our market and into those of New York and Boston.

I have thought the results of some experiments in preparing them worthy of a place in the Journal, for the information of any who may have calls for them, and would suggest that the names by which these pharmaceutical preparations are designated, should not be confounded with those applied to the pure resinoid principles they contain. As well might the Calasaya Extract of Ellis be called *quinia*, as the impure resinoid substance precipitated from a tincture of May-apple, by the above process, *podophyllin*.

The same remark applies to other resinous roots, and in the event of the adoption of a class of resinous extracts into Phar-

macy, such as form the subject of this essay, the question will arise and must be met, what name shall be given them?

Experiments upon May-apple Root.—On treating 2 pounds of this root in powder, with alcohol, sp. gr. .835, in the steam displacement apparatus of C. F. Smith, I obtained about half a gallon of a concentrated tincture; this was divided into two portions of two pints each.

Of these, the first was mixed with about four pints of water, and evaporated till the alcohol was all driven off. The aqueous liquid being now decanted, left a quantity of a light brown colored powder adhering to the dish, which being collected, washed and dried, weighed 219 grs., and very nearly corresponded in appearance with the *Podophyllin* of Merrill. The other portion of the tincture, consisting of two pints, was evaporated nearly to dryness, leaving one and three quarter ounces (av.) of alcoholic extract, too tenacious and deliquescent to powder.

500 grains of this extract were treated freely with boiling water, and the water being poured off, the resinoid substance was collected in the form of a shining mass of a dark brown color, the undissolved portion not adhering to this being also collected on a filter the whole weighed 138 grs. As thus prepared, it had a darker brown color than the first mentioned product, but in other respects resembled it.

It will be perceived from this, that the yield from May-apple Root treated with alcohol was as follows: By the evaporation of the tincture, one and three quarter ounces, av., (766 grs.;) from the troy pound, (5760 grs.) about *thirteen per cent*, by precipitating the resin with water, 219 grs. from the same quantity, *three and three quarters per cent.* Corresponding precisely with the results of the experiment with the extract, 500 grs of which yielded 138 grs. of the resin. With a view to testing the expediency of depriving the root of all its principles soluble in water, previous to treating it for the resin, I boiled a portion of it in water, and submitted the pulpy mass to pressure to deprive it of the aqueous liquid; it was then allowed to remain, with a view to drying off; but owing to the pulpy nature of the magma, I could not conveniently dry it before it threatened decomposition, and was obliged to treat it with alcohol while yet moist. By this means, an extract was obtained which weighed nearly 50 per

cent more than the previous extract made with strong alcohol, and which, on being treated with water, yielded a comparatively small proportion of the precipitated resin.

As obtained by the process first detailed, the precipitated resin of Podophyllum is of sufficient purity for convenient medical use, being nearly four times the strength of the extract prepared with strong alcohol, and much stronger as compared with the hydro alcoholic extract officinal in the Pharmacopœia.

The "Eclectics" recommend it as "a powerful cholagogue cathartic, substituting, and for all useful purposes more than substituting, the long celebrated 'Sub Murias Hydrargyri' of the old school,"—a recommendation which most regular physicians will accept with several grains of allowance. It is given in doses of from half to two or three grains, triturated with sugar or with some mild cathartic. It has a more or less light brown color, with a very strong characteristic odor and taste, is freely soluble in alcohol, is separated by ether into two resins, one soluble (largest in quantity,) and the other insoluble in that liquid. It is nearly insoluble in oil of turpentine. With carbonate of potassa it furnishes a solution, which on the addition of an acid throws down the resin. The alcoholic and ethereal solutions treated with animal charcoal and evaporated, furnished the resin of a lighter color, though not pure.

One advantage offered by this preparation which may not at first occur to the reader, is the absence of that tenacious character which belongs to the Hydro-Alcoholic Extract of Podophyllum, and renders, it like the similar extract of Jalap, exceedingly troublesome to make into pills, or to combine in any other form for use; it is, moreover, when properly prepared, of uniform strength, neither absorbing nor parting with moisture on exposure.

On reference to the thesis of the late John R. Lewis, published in this Journal, (vol. xiii, new series, page 165,) I find that the chemical characters of May-apple root were thoroughly investigated by him, and the active principle podophyllin was isolated in the different forms of opaque feathery scales, a light colorless powder, a translucent gelatinized mass (believed to be a hydrate), and in globules like dried gelatin. He also bears testimony to its activity as a drastic cathartic, in what would appear to be the very excessive dose of six grains.

My object in the foregoing remarks has not been to add to the facts already known upon the chemical history of May-apple, so much as to introduce to the profession, a pharmaceutical preparation and process for preparing it, which I think offers some advantages over the extract in common use, and is at least worthy of a trial at the hands of scientific physicians, in order that its real merits may appear.

Experiment upon Black Snake Root.—Following the process spoken of in the essay quoted above, I submitted two pounds of black snake root or cohosh, to the action of alcohol by the displacement process. A large quantity of alcohol was necessary to exhaust it in this way, which was partially recovered by the use of a tin retort, and Liebig's condenser; after obtaining the tincture in a concentrated form, measuring about twelve fluid ounces, it was mixed with twice its bulk of water and the alcohol evaporated off. The resinous deposit being collected, was a shining mass of a dull garnet color, translucent along the edges. It possessed a faint odor with the peculiar taste of the root in a high degree; when powdered, it resembled in color the resin obtained from podophyllum. This is the preparation called by Merrill, *Macrotin*, from the name given to Cimicifuga in Eaton's Manual, "Macrotys Racemosa."

The proportion obtained from two pounds of the root was about one and a half ounces, (av.), and the residue upon evaporation after the precipitation of the resin from the tincture, weighed two and three quarters ounces, (av.), so that the root yielded *four* and *three quarters per cent.* of the precipitated resin, and would have yielded *thirteen and a quarter per cent.* of alcoholic extract. The dose is stated, by Merrill, at from one to six grains in the course of the day, given in pills. The reputation this root has attained, especially in the treatment of chorea, leaves little room to doubt that such a preparation would be a useful addition to the material of our practitioners.

The resin obtained in this way from *Leptandra virginica* or Black root, is I believe a discovery or invention of the author I have quoted; very little is known of the medical properties of this root among regular practitioners, but if his account be credited "its medicinal action is that of cholagogue, and hepatic, with but feeble cathartic powers, and acting in small doses as a tonic on the primæ viæ; it hence fills a previously existing blank

in the Materia Medica." "*Leptandrin*" is represented as a jet black substance resembling asphaltum.

Sanguinaria canadensis yields to treatment such as described, a bright red substance, of a resinous character, said to contain both its resinoid and alkaloid principles; but of this, considering the relations and habitudes of the latter, there would seem to be some doubt. The so called Sanguinarin of Merrill, however, is said to have met with some favor, as combining the stimulating and narcotic powers of the root in a concentrated form. My experiments upon it have not been sufficiently matured up to the time of going to press to lead to a satisfactory account of its chemical characters.

Of the numerous other preparations spoken of in the article from which I have quoted, some are purely empirical, others are prepared from vegetable simples, with the medicinal value of which, (if they possess any), the regular profession is but little acquainted, and others are well known to pharmaceutists generally, and are found in the shops of regular as well as of the self styled "Eclectic Pharmaceutists."

ON THE PREPARATION OF VOLATILE OIL OF ROSES IN THE EAST.

By Dr. X. Landerer,

Hon. Member of the Pharmaceutical Society of Great Britian, Professor in the University of Athens, Pharmacien to the King of Greece, &c.

Pharmacologists distinguish two varieties of essential oil of roses, namely, the Indian (*Oleum rosarum Indicum*,) and that from the Levant (*Oleum rosarum Levanticum.*)

These volatile oils are obtained from various species of rose, but principally from *Rosa sempervirens*, *R. moschata* and *R. centifolia.*

The methods by which the oil is extracted are various. In India the fresh petals are allowed to macerate in water in vessels exposed to the sun, and the oil which is found floating on the surface, is removed by decantation. Distillation with water is sometimes resorted to, the volatile oil being separated in a congealed state after exposure to the well saturated rose water in a

cold place for several nights. The process adopted in China is somewhat different. The seeds of a species of *Digitalis* called *Sisama* are placed on layers of fresh roses, and after a contact of some days, both are submitted to strong pressure; from a fatty oil thus obtained, the volatile oil of roses is separated by distillation.

To the foregoing descriptions, I am desirous of adding that of another not so generally known, for the account of which I am indebted to a person who was engaged for several years in the manufacture of essential oil of roses at Damascus, and in some other parts of Asia Minor. It is a fact there well known, that oil of roses prepared by ordinary distillation, separates itself from the rose water in the form of a stearoptene. In order to obtain it liquid, transparent, dry and bright, as seen in commerce, it becomes needful to submit fresh roses to dry distillation. The following is the process:—The rose-buds collected before sun-rise and deprived of the calyx and other green portions, are packed while yet fresh in a glass retort of the same description as those made at Cairo. The retort is placed in a salt water bath, and a dry distillation is carried on, during which process the heat is cautiously increased, care being always taken that the contents of the retort do not become scorched. In order to diminish the loss of heat, the retort is surrounded by coarse cloths. The product of this distillation consists of a watery liquid of a deep brown color, upon which floats the oil of roses. The separation of the latter is effected in the usual way; the aqueous portion is also reserved, being highly esteemed in the East as a perfume. When separated, the oil is mixed with salt water, by which it acquires a paler color; packed in small vials it is carried to Constantinople, under the name of *Güll Jaghi*, or oil of roses.

[In English commerce the wholesale dealers distinguish no other variety of oil of roses than the Levantine, which is imported from Turkey and sold as Turkish Otto of Roses.]—*London Pharm. Journ.*, Sept. 1851.

ON THE MANUFACTURE OF CREAM OF TARTAR, TARTARIC ACID, PARATARTARIC ACID, CARBONATE OF SODA, SULPHATE OF POTASH, ROCHELLE SALT, AND CITRIC ACID.

Manufacture of Cream of Tartar.—One of the constituents of of the juice of the grape is the bitartrate of potash, which, in the form of what is called in commerce *tartar* and *argol*, is deposited in the wine casks on the commencement of fermentation, and this salt being but slightly soluble in dilute alcohol, the quantity deposited increases in proportion as the fermentation, and consequent increase of spirit in the liquid, progresses. Another portion of the tartar or argol is obtained from the marc or mass of grape stalks and husks remaining after the juice has been pressed out: and a further portion is found in the froth or scum which rises to the surface of the fermented liquors. From one or all of these sources combined, the cream and tartar of commerce is obtained. For this purpose the tartar deposit or scum is placed in a copper full of water, and boiled for an hour or so, to dissolve out the bitartrate of potash. This solution is then filtered off into large coolers, where colored crystals of tartar are obtained, free from many of the impurities previously contained in it. These colored crystals of tartar are then returned to the copper, and dissolved by boiling in water; a quantity of animal charcoal is next added for the purpose of decolorizing the solution, and shortly afterwards some white clay for the purpose of finishing the discoloration and removing the animal charcoal employed. The colorless solution is filtered off into crystallizing vessels as before, and thus colorless crystals of cream of tartar are obtained. If the crystals be not sufficiently white, the second part of the process may be repeated. As, however, it often happens that these tartar deposits contain a good deal of tartrate of lime, the manufacturers at Montpelier have of late introduced some improvements in the making of cream of tartar, with the view of transforming this tartrate of lime, which would otherwise be lost, into bitartrate of potash. To effect this, the matters containing tartrate of lime are boiled with sulphate of potash and an excess of sulphuric acid, by which means sulphate of lime and bitartrate of potash are obtained. Another improvement lately adopted, consists in converting the neutral tartrate of potash,

which is found in the mother-liquors, resulting from the first operation in the manufacture of cream of tartar, into bitartrate, especially when the matters operated on have undergone a commencement of fermentation. As, instead of water, these mother-liquors are employed in the solutions of fresh portions of the raw materials, they at length become charged with neutral tartrate of potash. To convert this neutral tartrate into bitartrate of potash, sulphuric acid is added until no further precipitation of bitartrate takes place: the mother-liquor contains, together with some bitartrate in solution, sulphate of potash, which serves in the beforementioned process for converting tartrate of lime into bitartrate of potash.

Manufacture of Tartaric Acid.—The process indicated by the London Pharmacopœia is not now adopted on the large scale; the following is the process commercially employed. A large wooden vat or generator, as it is termed, closed at the top, and furnished with a man-hole secured by a water joint, is the apparatus or vessel used for the decomposition of the tartar and liberation of the tartaric acid. This generator is provided with an exit-pipe for the escape of the carbonic acid gas, liberated during the process, and an agitator or stirrer, consisting of a stout iron rod having attached to its lower extremity a long arm of wood to stir the contents of the generator, the upper extremity of the rod being connected by means of appropriate machinery with some motive power, as that of a steam engine. The generator is usually of a capacity of about 2000 gallons, and is larger at its base than at its summit. A pipe, in connection with a steam-boiler, enters at the side of the generator, and another pipe connected with a reservoir of cold water, enters the upper part of the generator, which is also provided with cocks at suitable levels for the purpose of drawing off the contents. Into this generator, about one-fourth filled with water, 1500 pounds more or less (according to the quality of the tartar employed,) of whiting or washed chalk (carbonate of lime,) are introduced, steam is then allowed to blow in from the boiler so as to heat the water, and the agitator is set in motion until the lumps of the whiting are broken and a mass of uniform consistence obtained; this done, about two tons of tartar of average quality are introduced by degrees, and the agitator again set

in motion; the result is, that the free tartaric acid contained in the bitartrate of potash unites with the base of the whiting, forming insoluble tartrate of lime, which precipitates to the bottom of the generator, leaving the neutral tartrate of potash in solution, the carbonic acid having escaped through the exit-pipe in the gaseous form.

Having thus removed one equivalent of tartaric acid from its combination with potash, the next part of the process is to remove the other; and this is effected by the addition of sulphate of lime in the state of paste, to the solution of tartrate of potash; heat and agitation are again applied, the tartrate of potash is decomposed, the second equivalent of tartaric acid enters into combination with the base of the sulphate of lime, and tartrate of lime precipitates to the bottom to join that formed in the previous operation, whilst the potash united with sulphuric acid remains in solution as sulphate of potash. The solution of sulphate of potash thus formed, is drawn off when clear, into suitable reservoirs to be treated, as hereinafter described. The tartrate of lime is next well washed with two or more successive charges of cold water; these washings contain more or less of sulphate of potash, and are run off into suitable reservoirs. To the remaining tartrate of lime a sufficient quantity of water is then added, together with the requisite quantity of sulphuric acid, to effect its decomposition; sulphate of lime is precipitated, and tartaric acid remains in solution. The whole contents of the generator are now run off into a wooden back lined with lead, some fifteen or sixteen feet in length, six in width, and two in depth, furnished with a perforated false bottom, and lined throughout with stout twilled flannel. This back serves as a filter, and the filtered solution of tartaric acid passes off through a pipe, connected with the bottom of the back, into suitable reservoirs. When the acid solution has passed through the filter, water is carefully added to the sulphate of lime remaining, in such a way as to insure its uniform percolation through the mass, and not to run off through partial channels or fissures formed in the sulphate, which would prevent the entire removal of the acid. As soon as the residuary sulphate of lime is quite tasteless, and the filtered liquor free from tartaric acid, the pasty mass of sulphate of lime is removed by means of wooden shovels, and as much of it as may be required is again used in the

decomposition of the neutral tartrate of potash solution of the succeeding operation; whilst that portion of it which is not required for that purpose, may be dried over the coke ovens hereinafter mentioned, and sold as manure. The expense of chloride of calcium, formerly employed to effect the decomposition of the tartrate of potash, is thus saved, and the decomposition quite as effectually accomplished. The filtered solution of tartaric acid is next concentrated by evaporation, and crystallized; for this purpose it is placed in wooden vessels lined with lead, of various lengths and widths, and about nine inches deep, along which coils of lead-pipe are made to traverse; steam is then passed through these pipes, and the concentration of the acid is thus effected. Deposits of sulphate of lime, held in solution by the acid, take place around the lead pipes during the process of concentration. As the solution of tartaric acid is readily decomposed, care should be taken that the temperature does not much exceed 165° Fahr. There can be no doubt that the adoption of the vacuum-pan would prove highly advantageous in the concentration of tartaric acid solutions. The plan of pumping cold air into the tartaric acid solution whilst undergoing concentration, has been tried on a large scale, but experience having proved that a loss of acid resulted, the process has been abandoned.

When the liquor has attained the specific gravity of about 1500° it is drawn off into suitable crystallizing vessels; these are formed of sheet-lead, are cylindrical in shape, usually about four feet in heighth, and two feet in diameter, and each capable of holding about five cwt. of tartaric acid in solution; these crystallizers are placed in a warm situation, and in the course of three or four days there is produced in each a crop of crystals averaging about two cwt. These crystals, however, contain a portion of coloring matter, which is removed by placing them in a vessel lined with lead. with water and animal charcoal (previously well washed with dilute hydrochloric acid to remove the calcareous salts contained in it,) steam is blown in, the acid is dissolved, and the saturated solution digested with the animal charcoal, filtered, again concentrated, and crystallized. The crystals are next washed, drained, and lastly, dried on wooden trays lined with thin sheet-lead, placed in a room heated by steam.

By these means, a colorless acid of great purity is obtained, which is then packed in casks for sale. The mother-liquors of the first crystallization are again concentrated, and the crystals obtained, digested as oefore described with animal charcoal, until at last, by the accumulation of vegetable and other foreign matters, the liquors are no longer crystallizable; they are then decomposed by means of chalk, and the tartrate of lime thus obtained added to the produce of a new operation. It is found in practice that a slight excess of sulphuric acid is necessary in order to obtain fine crystals of tartaric acid; care, however, must be taken to guard against the accumulation of sulphuric acid in the process of manufacture, to the risk of destroying the tartaric acid.

With respect to the drying of this acid, there can be no doubt that the centrifugal method of drying would be far superior to the present mode, as the crystals often adhere to the lead-lining of the drying trays, and having to be forcibly detached, their shape and the general appearance of the acid becomes much impaired; whereas, by the centrifugal mode of drying, the crystals may be obtained of a more perfect and regular shape, and the general appearance of the acid greatly improved.

The principal consumers of tartaric acid are the calico-printers, who use it for the purpose of evolving chlorine from solution of chloride of lime, in the production of white, or what is technically termed discharged patterns upon a colored ground. Its pharmaceutical uses are too well known to require comment. The *average* annual quantity manufactured in Great Britain may be taken at about 1,000 tons, of which a certain quantity is exported to the continent of Europe and to the United States.

Paratartaric Acid.—There is occasionally to be met with in the market, a tartar obtained from the grapes grown in the department of Vosges, which contains a large proportion of paratartaric or racemic acid. This acid may be distinguished from tartaric acid by its silky, needle-shaped crystals, and its insolubility compared with tartaric acid, 100 parts of water at 60° dissolving only 14.1 racemic acid, whilst 100 parts of water at 60° dissolves 64.8 of tartaric acid. In the second volume of the Records of General Science, will be found a series of papers on this acid and its

combinations, by Dr. Thomas Thomson. A striking difference between tartaric and racemic acids is exhibited, when we drop solutions of these acids into solutions of chloride of calcium. The former occasions no precipitate, while the latter throws down a copious deposit. Thus we see that racemic is a more powerful acid than tartaric. Accordingly, it is capable of decomposing various tartrates and taking the place of their acid. M. Kestner, a manufacturer of tartaric acid at Thann, a small town in the department of the Vosges, first noticed the existence of this acid about the year 1817. A few months since he called the attention of M. Pelouse to the circumstance, that of late years he had not met with this acid in the ordinary course of maufacturing tartaric acid. It would appear from M. Kestner's letter to M. Pelouze, and which was read at one of the sittings of the Paris Academy of Sciences, that in the years 1822 to 1824, he was in the habit of decomposing the crude tartars he employed, by carbonate of lime, using a large excess of sulphuric acid in the decomposition of the tartrate of lime, and passing a current of chlorine gas through the tartaric acid solution for the purpose of removing its color; but that since 1824, he has been accustomed to decompose the tartar by caustic lime, using a slight excess only of sulphuric acid in the decomposition of the tartrate of lime, and omitting the bleaching process. During the period he employed the first named process, he frequently detected the presence of paratartaric acid, especially in winter; but from the time of his discontinuing that process up to the present time, he has failed in obtaining the slightest indication of it. He furnishes no analysis of the tartars employed at those respective periods, and confesses himself quite at a loss to account for these phenomena. He concludes by expressing the hope, that the future researches of scientific men may throw some light upon the obscurity in which this subject is at present involved.

Recent investigations have led to the conclusion that most tartars contain a certain portion of paratartaric acid, which is lost in the process at present employed in the manufacture of tartaric acid. This fact may serve to account for the deficient results sometimes obtained.

Manufacture of Sulphate of Potash.—The solution of sulphate of potash, resulting from the decomposition of the neutral tartrate of potash by sulphate of lime, as above mentioned, is run into sheet-iron boilers placed over a coke oven, in which it is concentrated to a certain extent, and is then drawn off into suitable vessels of iron, or wood lined with lead, in which the evaporation is completed by means of steam from the boiler in which the weaker liquors are evaporated, the steam thus generated being made to traverse coils of lead or iron pipe placed in the solution. The sulphate of potash crystallizes as soon as the liquor has acquired a certain density, and falling to the bottom of the vessel, or becoming attached to its sides, is readily fished out by means of strainers; and its superfluous moisture having been allowed to drain out, it is packed in a somewhat damp state in casks ready for sale. In this process the spare heat of the coke oven is made available, and as the complete evaporation of the solution is accomplished by the agency of the steam from the boiler, the greatest possibly economy is thus effected as regards fuel. This process is, of course, applicable to a variety of other purposes where large quantities of weak liquors have to be evaporated, and where a market can be obtained for the coke manufactured. The principal consumers of this impure sulphate of potash are the manufacturers of prussiate of potash : it has also been applicable as manure.

Pure sulphate of potash may be obtained by dissolving the impure salt, digesting it with animal charcoal, filtering and recrystallizing.

Bisulphate of potash may also be obtained by heating the impure salt with the requisite excess of sulphuric acid, and proceeding as above.

Mr. A. J. Phillips read a paper a few days since at the Chemical Society on a double salt of sulphate of potash and lime, discovered by him to exist in the deposit from the sulphate of potash in liquors in the boilers before mentioned. As this paper will no doubt appear in the Quarterly Journal of the proceedings of the Chemical Society, we will confine ourselves to simply mentioning the constitution of this double salt as furnished by two analyses of Mr. Phillips:

	No. 1.	No. 2.
Potash . . .	28.52	28.57
Lime . . .	16.99	16.96
Sulphuric acid .	48.94	48.55
Water . . .	5.51	5.67
	99.96	99.75

The purchasers of crude sulphate of potash will be much obliged to Mr. Phillips for this communication.

Manufacture of Bicarbonate of Soda.—In our notice of the process employed in the manufacture of tartaric acid, we mentioned that whiting or carbonate of lime was employed for the purpose of taking up the free acid in the bitartrate of potash, this action being attended with a copious evolution of carbonic acid gas; the carbonic acid so liberated, is employed in the manufacture of bicarbonate of soda. For this purpose, a series of two or more square air-tight wooden vessels, lined with lead, and fitted with a perforated false bottom placed about one foot from the lowest part of the vessel, are filled with crystals of carbonate of soda (the common commercial soda,) and connection established between them by means of leaden pipes. Into the first vessel of the series, the carbonic acid gas, previously passed through water, is introduced, and after a few days the crystals of soda will be found to be converted into bicarbonate, which is then removed, dried, and having been ground to the requisite degree of fineness, packed in casks for sale. Ten cwt. of crystals of soda yield upwards of five cwt. of bicarbonate. The water of crystallization contained in the crystals of the bicarbonate, passes through the perforated division with the lower compartment of the vessel, whence it is drawn off by means of a cock placed for that purpose, and as it contains a certain portion of soda, it is used in the manufacture of Rochelle salt, which we shall presently describe, or for any other purpose requiring a solution of soda.

It will be obvious, that carbonic acid gas from any other source will do equally as well for the manufacturer of bicarbonate of soda as that obtained as above described.

Manufacture of Rochelle Salt.—This double tartrate of soda and potash is prepared in the same apparatus as that described in the manufacture of tartaric acid. A solution of crystals of soda is first made, and to it is gradually added the bitartrate of potash in the form of crude tartar, the free tartaric acid in the bitartrate combines with the soda, carbonic acid is evolved, and the resulting solution is composed of one equivalent of neutral tartrate of soda and one of neutral tartrate of potash. This solution is drawn off, concentrated by evaporation, crystallized, the crystals re-dissolved and digested with animal charcoal, the solution filtered and re-crystallized; the product obtained consists of colorless crystals of Rochelle salt.

Manufacture of Citric Acid.—In the manufacture of citric acid the same apparatus is employed as we have described under tartaric acid. Into the generator any given quantity of concentrated lime or lemon-juice, as imported from Sicily, is placed, and to it is added as much whiting as will suffice to neutralize the citric acid it contains; carbonic acid gas is evolved, which may be applied to the manufacture of bicarbonate soda and carbonate of lime, as above mentioned, and citrate of lime is precipitated to the bottom of the generator. The supernatant liquor containing much of the extractive matter of the lime-juice is run off, and as much dilute sulphuric acid added to the sulphate of lime as will serve to liberate the citric acid it contains, whilst the sulphate of lime formed is precipitated. The mixture of citric acid and sulphate of lime is then run off to a filter back, arranged in the same way as that described in treating tartaric acid, and the operations of washing the residuary sulphate on the filter, concentrating the juice by evaporation, and subsequent crystallization and purification, are all precisely similar to those described under tartaric acid. As citric acid is even more liable to decomposition than tartaric acid, still greater care must be taken in its concentration and subsequent treatment. Evaporation in vacuo is particularly desirable in the case of citric acid, and the centrifugal process of drying might also be employed with great advantage.—*Pharmaceutical Journal and Transactions*, February, 1851.

ON THE MEDICINAL PROPERTIES OF THE GUACO.

By P. L. Simmonds, Esq.

At a time when cholera has been committing great ravages throughout our West India Colonies, I beg to bring under the more general notice of the profession a remedy which has been effectually tried and found useful in several quarters. The "Bijuco de Guaco," the *Mikania Guaco*, a creeping plant, native of South America, but now naturalized among the Antilles, has long been held in repute as an antidote to the bite of snakes; its medical properties, have not, however, hitherto been fully described. There are several species of Eupatorium closely allied to this guaco, and many varieties of the Milkania, so that among fifty or sixty of them it is difficult to identify the true medicinal guaco, or that which is here specifically recommended.

The leaves of the best sort are stated to be heart-shaped, from four to six inches long, by two or three broad, the edges slightly curved and a little notched, of a fine dark green on one side and of a light purple changing color on the other. The leaves and stem are pubescent, and have a very bitter pungent taste. There are two principal kinds, distinguished by the flowers, those of the one being pale yellow, and the other white. The former is preferred.

Some years ago Mr. Henry Vendryes delivered a lecture before the Jamaica Physical Society on the virtues of the plant. It was first introduced into use for its medical properties by Don Andres Diaz, of Havana; and Dr. Chabert, of that city, described its curative properties in cases of cholera, in the *Diario de la Habana*. In a pamphlet published by Don Andres Diaz he says—

"The preventive virtue of the guaco against all poisons is undeniable. My own estate having been visited by that awful scourge (the cholera), on the sixth day I found that twenty-eight of my people had died, and that twenty-two were in the hospital, all in the last stage of cholera. Seeing that, notwithstanding the treatment recommended by our medical faculty, our people were dying almost as soon as they were attacked by the malady, it struck me that by adopting the proposed remedy I might have a

chance of saving many of my fellow-creatures. I determined on trying it; I picked out three of the worst cases, and from the first dose which I gave them I began to observe its efficacy in producing the necessary reaction. At the same time that I gave the guaco to the sick, I caused the healthy also to take it, so that the malady soon ceased."

The author then gives a few statistical returns, which prove authentically that out of 400 persons who were attacked with cholera, on four plantations surrounding his own, and on which the guaco was used at his recommendation, only twenty-five died, and several of these from the remedy having been applied too late.

Three modes of administering it have been recommended:—

First, Combined with sulphuric acid, prepared in the following manner:—To one ounce of the boiled mucilage add four ounces of sulphuric ether, put into a well-corked bottle. Infuse for three or four hours and it will be fit for use. The mucilage is prepared by triturating in a mortar two ounces each of the stem and leaves of the plant, and boiling for one hour in a pint of water, straining the residue through a cloth, and expressing well the juice with the fingers. The mucilage is to be used cold when combined with the sulphuric ether.

Secondly, as a *ptisan*, prepared the same way as common tea, by infusing 1 oz. of the leaves and stem in a pint of boiling water; or by boiling the same quantities, if a strong decoction be required. The leaves and stem should be triturated before boiling or infusion.

Thirdly, as an elixir, prepared in the following manner:—Into four gallons of strong proof rum (17° if possible), put three pounds of stems and leaves of the plant, well triturated in a mortar, and after twenty four hours infusion, it will be fit for use. When the quantity has been reduced one-half, an equal proportion of spirits may be added. It must be used as strong as possible, or it is not to be depended upon for use internally, but may answer for baths. In case of the best sorts being obtained, it may be substituted for the sulphate of quinine, when the latter cannot be procured, and successfully in many other cases, I have no doubt, as a powerful tonic. Indeed the valuable properties it possesses, like those of the Cedron, are comparatively little known.

The genus *Mikania* was established by Willdenow, and the

celebrated Mutis, of Santa-Fe, first made known its medical properties as an antidote against the bite of certain serpents. Humboldt and M. Bonplandt have confirmed the powerful virtues of the plant.

The whole plant exhales a strong penetrating and nauseous odor. The bruised leaves are applied exteriorly to wounds. M. Mutis was desirous of ascertaining if inoculation with the guaco would render a person obnoxious to the bite of serpents for a lengthened period, but was prevented from completing his experiments by the refusal of the Grand Court of Justice at Santa-Fe to allow him to make them on criminals condemned to death. The negroes who wish to protect themselves against snake bites take the following precautions :—They make two incisions on the feet, two on the hands, and one on each side of the chest. They express the juice of the leaves of the guaco, which they pour on the incisions, as if inoculating. Before the operation they make the patient drink two spoonfuls of the juice, and they recommend his doing the same five or six times a month, to continue the virtues : one of the leaves of the plant is usually carried about the person, and the odor is said to have a stupifying effect on the reptiles.—*Alibert's New Elements of Therapeutics, p.* 500.

SOME PRACTICAL OBSERVATIONS UPON THE FORMATION AND GROWTH OF CRYSTALS.

By Mr. Wm. Copney.

In the following paper it is not contemplated to indicate or explain the methods by which these substances are prepared upon the large scale, but to offer to the chemical and pharmaceutical student some suggestions, whereby, when the subject of crystallography comes under his notice, he may be enabled to prepare for himself the great majority of those salts whose forms he is called upon to understand.

It may not, therefore, be out of place, to introduce the subject

by a brief statement of the modern mode of classifying these bodies.

Crystalline forms are collected into six groups or systems.

These are comprehended by two classes. To the first belong all those whose *axes* are of equal length, and at right angles to each other; to the second, those, the axes of which are of unequal length, and are not always at right angles to each other.

Class 1. *The Equiaxed*—Contains one system only, the Cubical or Regular, and to which a very large proportion of chemical and pharmaceutical salts belong. Common salt, alum, and iodide of potassium may be mentioned as examples. There are those who maintain that all the metals partake of the forms of this system.

Class 2. *The Unequiaxed.*—Here are included the remaining five groups, which are not improperly subdivided into *a* the dimetric, and *β* the trimetric.

To the dimetric belong the second system, or the square prismatic, which calomel, percyanide of mercury, and ferrocyanide of potassium serve to illustrate; and the third or rhombohedric, of which we have an example is calcareous spar.

The trimetric contains the fourth or right prismatic, of which sulphate of magnesia, sulphate of zinc, and citric acid are modified examples. The oblique prismatic well shown in sulphate of soda, binoxalate of potash, and tartaric acid; and, lastly, the doubly oblique prismatic, which will be easily remembered from its containing, among others, sulphate of copper and quadroxalate of potash.

The first point of importance in the production of well-formed crystals, is to ascertain the most suitable degree of saturation of the solution.

The proportions usually quoted in books, although frequently approximative, are not generally the best. Moreover these proportions must of necessity vary with the temperature. As a general rule, a completely saturated solution is not the most elegible, for, upon the slighest reduction of temrpeature, a considerable quantity of small crystals are deposited, while from a solution somewhat more dilute, fewer, larger, isolated, and more perfectly-formed crystals are generally obtained. A little practice will

soon enable us to define the most suitable condition in this respect.

In cases where the substance to be crystallized has to be eliminated, as the crystallizable alkaloids, vegetable acids, &c., the density or specific gravity becomes the only test by which to ascertain the proper degree of concentration. But here, again, we do not always succeed; for, although we may have found that very fine crystals were obtained on an occasion when the solution had an ascertained density, yet, unless the apartment into which it was set aside shall always have pretty nearly the same temperature, the crystals will not be satisfactorily produced.

So that, having acertained, in the one case, the best proportion of saline substance for solution in water, supposing that to be the menstruum, and the most suitable density in the other, care must be taken that the place where both are set aside, shall have a temperature subject only to a trifling variation. Underground places answer very well, in many instances; but in others, it is better that the temperature be a little higher, since it is found that if they be crystallized at a temperature lower than the average, they are apt, at a higher one, to give up a portion of their water, to become fluid, or to crack.

These conditions being determined, and a number of crystals obtained, we have now to consider the best mode of insuring their subsequent symmetrical growth. This may be effected in three ways, either by adding, at stated intervals, additional quantities of the salt dissolved in a small quantity of the solution itself; by adding to the solution a fluid capable of uniting with the menstruum, but in which the salt is insoluble; or, by an appropriate evaporation, *i. e.*, by reducing the solution to a given weight, and returning the crystals when it has sufficiently cooled, or by a continuously spontaneous evaporation, in a warm atmosphere, as in the cases of protonitrate (nitrate of the sub-oxide) of mercury, and sulphate of manganese.

Next in importance are the arrangements which affect the position of the crystals. For prisms (right or oblique) a flat-bottomed, smooth, shallow dish will be found the most suitable; for octahedrons, a cylindrical vessel, into which is suspended a piece of horse-hair or gut (to be had at the fishing-tackle warehouses, and known in the trade as "silk-worm gut.")

Matters being thus arranged, the solution is set aside for (say)

twenty-four hours. It is then removed from the vessel, and from the gut, in the one case, are removed all the octahedra, excepting those more perfectly formed together with the whole of those which may have attached themselves to the bottom of the vessel.

The prisms in the other case, which form upon the flat bottom of the vessel, are in like manner examined—the more perfect selected, the remainder removed. The respective liquors are then returned; at the bottom of the one are arranged the prisms, while in the other the gut is resuspended.

After another interval they are again similarly examined, small imperfect crystals removed, which, from the beginning, are to be perserved, the positions of the prisms reversed, and both—returned to their respective liquors—again set aside.

This removal of the small crystals is repeated daily, so long as any continue to be deposited, since by their growth, they would weaken the solution.

When the prisms and octahedrons have ceased to increase, and none, or scarcely any are deposited at the bottom, &c., the liquor may be removed to a cooler place,—the lower part of the building for instance—which in consequence of the temperature being more constant, is, perhaps, on the whole, the most suitable for the subsequent growth of the crystals.

When the liquor is at length so far reduced in strength that no further depositions are made, and no perceptible increase in the elected crystals is observable, the accumulated small crystals are redissolved by small quantities at a time, and added to the mother-liquor as before explained. These being exhausted, the crystals may be increased at pleasure, by preparing from a highly concentrated solution a quantity of the same compound, to be added gradually as before.

It remains to be added that in consequence of the liquor becoming denser in the lower than in the upper strata, and their consequent more rapid growth in the former, it is necessary not only to regulate the strength of the solution, in the manner referred to, but to reverse the position of the crystals themselves almost daily.

The gut, therefore, which has hitherto pierced the octahedra, must be cut off as close as possible, and attached externally by a noose, which will facilitate its removal and attachment.

It ought also to be added, that when a crystal is suspended, it

should be so arranged that two of the opposite planes may be placed horizontally, and that it is found expedient, for the purpose of perfecting the termini of the larger prisms, that they should be suspended vertically.

Several crystals were exhibited by Mr. Copney, which he had grown in the manner described in his paper. Among them were some perfect octahedra of chrome alum and common alum, of great size and beauty. The octahedron of chrome alum weighed $7\frac{3}{4}$ ounces, and the edges of the crystal were $2\frac{1}{2}$ inches in length. The octahedron of common alum weighed $6\frac{1}{2}$ ounces, and the edges were $2\frac{3}{8}$ inches in length. There was also a beautiful crystal, the nucleus of which was of common white alum, over which were depositions of a mixture of common alum and chrome alum, in such proportions as to give the crystal a beautiful pink, or slightly amethystine color. Sitll larger than these, however, was one of chrome alum, containing a little common alum, the weight of which was nine ounces, and the length of the edges $2\frac{1}{8}$ inches.

Besides, these crystals, there were some of unusually large size, of sulphate of magnesia, and of citric acid.

The whole of these crystals excited much admiration, and the author of the paper, a late pupil in the Society's school, was complimented for the skill he had manifested in producing such beautiful preparations from the small quantities of ingredients he had to operate upon. It was mentioned that the crystals of citric acid, which weighed nearly an ounce, were obtained from a pint and a half of lemon juice—*Transactions Pharm. Society, May* 1851.

COMPOSITION OF IPECACUANHA ROOT.

By Erwin Willick.

The author has examined the root of *Cephaëlis Ipecacuanha* in Rochleder's laboratory at Prague, and found small quantities of *fat*, traces of a *volatile oil*, *gum*, *starch*, *pectin*, *emetin*, *woody fibre*, and also a *peculiar acid*, erroneously considered by Pelletier as *gallic acid* The following are the results of this examition:—

Starch and Pectin.—If the triturated root be boiled with water, a brownish gelatinous liquid, having an unpleasant smell, is obtained. If this be strained through coarse linen, to remove the woody fibres, then diluted with a large quantity of water, and filtered through paper, a mucilaginous greyish substance remains on the filter, and, by drying, becomes hard, brittle and blackish-brown. When boiled with water, this substance yields a slightly yellow liquid, in which the presence of starch can easily be proved; if, however, ammonia be added to the boiling water, the liquid becomes dark-colored, and, upon the addition of diluted muriatic acid, gelatinous flocculi appear in it, which possess all the properties of pectic acid.

Gum and phosphatic salts.—The filtered liquid contains, besides emetin, and a few salts, a considerable quantity of gum. The liquid having been mixed with an aqueous solution of sugar of lead, let fall a brownish precipitate, which consisted, for the most part, of phosphate of lead, and the liquid filtered from this precipitate, yielded, when treated with the tribasic acetate of lead, a second precipitate, which was exhausted with water, and decomposed under water by sulphuretted hydrogen. The liquid filtered from the sulphuret of lead, was then evaporated to half its volume, and mixed with an excess of alcohol of 98 per cent., when a white substance precipitated, and was separated by filtration, washed and dried at 100° Cent.

This substance readily dissolved in water, and yielded, when boiled with diluted muriatic acid, grape sugar; when burnt, an incombustible residue remained behind, amounting to 1.14 per cent. The analysis showed 44.45 per cent. carbon, and 6.31 per cent. hydrogen, which corresponds to $C_{12} H^{40} O_{0}$, the formula of gum. In the alcoholic liquid filtered from the gum, the peculiar acid of ipecacuanha is contained. The liquid filtered from the precipitate produced by the tribasic acetate of lead, yielded, when treated with strong alcohol, a gummate of lead of a white color, which, being decomposed by sulphuretted hydrogen, filtered from the sulphuret of lead, and evaporated, yielded the largest quantity of gum. In the last mother-liquors, the emetin was contained.

Ipecacuanha acid, $C_{14} H_{8} O_{6}$. The powdered root was boiled with alcohol of 0.840, the filtered liquid treated with tribasic acetate of lead, the precipitate washed with alcohol of 0.830, and dis-

solved in diluted acetic acid, by which the phosphate of lead remains behind.

The acetic solution was mixed with the tribasic acetate of lead, the precipitate collected on the filter, and the filtered liquid decomposed by a small quantity of ammonia, by which a precipitate was obtained. Both precipitates were separately washed with alcohol of 98 per cent., mixed with ether, decomposed by sulphuretted hydrogen, and filtered from the sulphuret of lead.

The first precipitate gave a light yellow liquid. This was evaporated in the water-bath in a current of dry carbonic acid, till the ether had escaped. The residue was then mixed with water, filtered, in order to remove some fat, and digested with animal charcoal, and the reddish-brown liquid, filtered from the charcoal, and evaporated to dryness in the water-bath, in a current of carbonic acid. The residue, dried at 100° C., is the *hydrate of the ipecacuanha acid*. The second precipitate was treated like the first, and the analysis of the acid obtained from it, gave almost the same results.

Properties of Ipecacuanha acid.—This acid forms a reddish-brown substance, of a strong bitter taste; it is highly hygroscopic, soluble in ether, and more so in alcohol and water. The diluted watery solution yields with sugar of lead no precipitate; tribasic acetate of lead produces a brownish-white precipitate, which readily imbibes oxygen from the atmosphere, becoming at the same time darker colored. It also becomes darker colored by loss of water, and by drying under exclusion of the oxygen of the air.

A solution of a persalt of iron (chloride of iron) is colored green, even by a very diluted solution of the pure acid; ammonia produces a violet color, by an excess of ammonia the liquid becomes black like ink, and a blackish brown-sediment is formed in it. The salts of silver and mercury are reduced by the acid. The cupreous salts produce no precipitate with the acid, but on the addition of ammonia, a dirty, greenish-brown precipitate is produced. If a solution of the pure acid, mixed with alkalies, be exposed to the atmosphere, a dark, blackish-brown coloration, with absorption of oxygen, is very soon perceptible. This tendency to absorb oxygen, although in slighter degree, belongs to the pure acid, as well as to its salts. When heated, the acid fuses, and evolves a penetrating odor of formic acid, and leaves behind a vesicular coal, which is burnt with difficulty.

It dissolves in concentrated sulphuric acid with a brownish-red coloration, and on the addition of water, grey flocculi are precipitated. Nitric acid dissolves it with a deep reddish-yellow color; upon the application of a slight heat, a lively development of gas takes place, the solution simultaneously becoming yellow. Analysis of the two precipitates described above showed that the acid had the following composition :—

Carbon,	56.36	56.11	14 =	1050.0	56.37
Hydrogen	6.23	6.22	9 =	112.5	6.04
Oxygen,	37.41	37.66	7 =	700.0	37.59
				1862.5	

The compounds of this acid, examined by the author, had the composition represented by the following formulæ :—

Hydrate of ipecacuanha acid, $C_{14} H_8 O_6 + HO$.
First salt of lead, $C_{14} H_8 O_6 + Pb O + HO$.
Second salt of lead, $6 (C_{14} H_8 O_6) + 5 Pb O + 4 HO$.
Third salt of lead, $2 (C_{14} H_8 O_6) + Pb O + HO$.
Fourth salt of lead, $6 (C_{14} H O_6) + 7 Pb O + 6 HO$.

The analysis of the hydrate, and of the various combinations with lead, prove that the acid contained in the ipecacuanha is not gallic acid, but a peculiar new acid. By these combinations, as by some reactions *e. g.* with the persalts of iron, it is shown to be very analogous to caffeo-tannic acid, whose presence in various plants of the family of the Rubiaceæ, gen. Coffeacea, namely, in the seeds of *Coffea arabica*, and in the root of *Chiococca racemosa*, has been proved. The difference between the two acids consists only in the proportion of oxygen :

Caffeo-tannic acid, $= C_{14} H_8 O_7$.
Ipecacuanha acid (anhydrous), $= C_{14} H_8 O_6$.

By the discovery of this acid, the group of those acids which are contained in various plants of the family Rubiaceæ, has been increased by one member :

Catechin, from *Nauclea Gambir* (dried *in vacuo*) $= C_{14} H_9 O_9$.
Kinic acid (in its salt of lead,) $= C_{42} H_8 O_8$.
Caffeo-tannic acid (dried at 100°) $= C_{14} H_8 O_7$.
Ipecacuanha acid (anhydrous,) $= C_{14} H_8 O_6$.

London Pharm. Jour., June, 1851, *from Central Blatt*, 1851.

ON THE COMPOUNDS OF IODINE WITH QUININE AND MORPHINE.

By F. L. Winckler.

Equivalents of iodide of potassium and sulphate of quinine dissolved in boiling water furnish regular crystals of sulphate of quinine free from iodine; and similar results are obtained when other salts of quinine with oxyacids are employed instead of the sulphate. Very different results are obtained with the hydracids. Equivalents of muriate of quinine and iodide of potassium deposit a small quantity of a turpentine-like precipitate of iodide of quinine. Further experiment showed that, to decompose the muriate of quinine, 4 equivs. of iodide of potassium are requisite, and there is then produced a compound of—

+

Iodide of Quinine, Ch^2 I.—This compound has, when dry, the properties of a resin; after cooling, it is very easily reduced to powder, without becoming electric on friction, like pure quinine; and it furnishes a perfectly white inodorous powder, of an extremely bitter taste, which does not alter in the air. The compound is more soluble in water than the sulphate of quinine, and almost in every proportion in alcohol and in ether; all the solutions are perfectly clear and colorless, and leave on evaporation the iodide of quinine in the form of a transparent resin. The salt is instantly decomposed, with elimination of iodine, by concentrated sulphuric and nitric acids, and by chlorine; when burnt upon platinum foil, it left not a trace of potash; the cinder is difficult to burn. It furnished on analysis—

Quinine, . . .	71·58	2 =	4111·024	72·166
Iodine, ...	28·42	1	1585·570	27·834

+

Iodide of Morphine, MoI, is obtained by dissolving 120 equivs. of dry acetate of morphine in 8 times the weight of cold distilled water, adding if necessary a few drops of pure acetic acid, and mixing the filtered solution with a solution of 60 equivs. of iodide of potassium. After some time the salt crystallizes out in very slender crystals, which, however, are obtained of much larger size when the mixture is heated on the water-bath, and is allowed to cool slowly. In this manner it is obtained in transparent, shining,

colorless, four-sided prisms, which cannot be distinguished from those of the sulphate of quinine. Indeed in the dry state it would be perfectly impossible to distinguish between these two compounds without the aid of chemical reagents.

Iodide of morphine is not perceptibly soluble in cold water; it dissolves abundantly in hot water and readily in alcohol; the solutions have a very bitter taste. Analysis gave—

Morphine, . . .	71·4	1 =	3927·0	71·24
Iodine, ...	28·6	1	1585·6	28·76

The author draws attention to the probably important medicinal properties of these compounds.—*London Chem. Gaz., April* 1, 1851, *from Jahrb. fur Prakt. Pharm.*, xx. p. 321.

ON THE PRESERVATION OF ALIMENTARY VEGETABLE SUBSTANCES.

By M. Masson.

This process consists, first, in drying the matters at a moderate temperature in a stove for such time as is sufficient to expel the superabundant water which is not indispensible to the constitution of the vegetables, and then pressing them strongly in a hydraulic press.

The substances are first carefully picked, and the harder portions separated, as in the ordinary culinary method. They are next placed upon sieves of basket-work, or pieces of linen or canvass nailed upon a frame, and exposed to the action of hot air in a stove heated to about 118° F., for the most aqueous vegetables. A current of the heated air passes continually through the apparatus during the operation.

Some experiments were made by the Commission of the Academy to test the process.

920 kilogrms. of broccoli were picked, and yielded 725 kilogrms. of green matter for drying. After exposure in the drying apparatus for twenty-four hours to a temperature varying from 104° to 118° F., they were reduced to 69 kilogrms. of dry matter, having thus lost 656 kilogrms. of water, or 87 per cent. of their

original weight. The other experiment was made with spinach. 820 kilogrms. of raw spinach were picked, and thus reduced to 639 kilogrms. of matter for drying. These in twenty-four hours were reduced to 71 kilogrms. of dry matter, having thus lost 89 per cent. of their weight. Pressure in the hydraulic press subsequently reduced the volume, bringing the density to 550 or 600 kilogrms. for the cubic metre.

The vegetables subjected to this process present a satisfactory odor and appearance, retain their flexibility and natural color; and the form is so well kept in some, that they have the aspect of recently-gathered vegetables. When subsequently immersed in hot water, they absorb the principal part of the water lost during the desiccation. The following table exhibits the results thus obtained :—

Vegetable used.	Weight before immersion.	Temperature of the water.	Duration of the immersion.	Weight after immersion.	Proportion of weights before and after immersion.
Common cabbage, . .	280 grms.	122° F.	33m	1·480	5·30
Brussels sprouts, . . .	139	122	38	0·630	4·53
Celery, ...	130	122	41	0·510	3·93
Spinach, ...	87	113	30	0·475	5·47

This mode of preservation of vegetables evidently offers peculiar advantages in its application to the use of the army and navy.—*London Chem. Gaz.*, July 15, 1851, from *Comptes Rendus*, May 19, 1851.

ON THE COMPOSITION OF THE BITTER PRINCIPLE OF ARTEMISIA ABSINTHIUM.

By Dr. E. Luck.

Mein and Righini have described methods more or less tedious for preparing pure absinthine. The former chemist states that he obtained it crystalline and white. To obtain this substance, I proceeded in the following manner :—The dry herb was exhausted with alcohol of 0.863, and the clear liquid distilled to the consistence of a syrup, the residue transferred into a stoppered bottle, and well shaken with ether. After some time this separates with a yellowish-brown color. This treatment with ether is repeated until it no longer has a very bitter taste. The etherial liquid is

distilled in the water-bath; the residue consists of a viscid mixture of a blackish-brown acid resin and absinthine. On treating it with water to which a few drops of ammonia have been added, the black smeary resin is principally taken up, and the greater portion of the absinthine left behind.

In proportion as it becomes purer it acquires a pulverulent form. On adding a further quantity of ammonia, absinthine is also dissolved; but on triturating with concentrated ammonia, far less passes into solution, because the compound of ammonia with absinthine is very sparingly soluble in ammonia.

To remove the ammonia, it is now digested with dilute hydrochloric acid, then washed with water, dissolved in alcohol, and solution of acetate of lead mixed with it as long as any turbidity results, filtered, and sulphuretted hydrogen passed into the liquid in order to decompose the excess of the lead salt. The alcoholic solution filtered from the sulphuret of lead is mixed with a small quantity of water, allowed to evaporate slowly in a warm place, when the absinthine separates in yellow resinous drops. These are soft, become coated when mixed with water with an opake membrane, and in the course of some weeks all the drops become converted into hard masses, which externally are jagged and rough; internally, radiate and indistinctly crystalline.

The color is brownish-yellow to yellow; when pulverized, it furnishes a yellowish powder, of a faint, disagreeable, bitter odor of wormwood; it has an intensely bitter taste, is sparingly soluble in water, and melts in boiling water. It dissolves readily in alcohol, somewhat less in ether, and is likewise soluble in concentrated acetic acid, from which it is partially precipitated by water. It has a tolerably acid reaction, and dissolves, as above stated, somewhat in an aqueous solution of ammonia, but far more readily in caustic potash, with a golden-yellow color. Cold sulphuric acid dissolves it at first with a reddish-yellow color, which, however, quickly turns indigo-blue by exposure to the air, apparently with absorption of oxygen. Water produces in this blue solution a dirty gray-green flocculent precipitate, and the supernatant liquid is of a rose color. After the flakes have been washed on the filter with water, they dissolve readily in alcohol with a yellow color, but sparingly in ether. This substance has no longer a bitter taste; and its spirituous solution leaves on evaporation a

violet-blue amorphous residue, which again dissolves with a yellow color.

Hydrochloric acid dissolves absinthine with a yellow color, which on the application of a gentle heat passes into red; subsequently the color becomes darker, with a turbidity and separation of a brown mass: it dissolves in fuming sulphuric acid with a brown color. Heated upon platinum foil, it is partially volatilized in brownish-yellow bitter vapors, which condense into an amorphous substance, but the greater portion is carbonized. The substance, dried *in vacuo* over sulphuric acid, gave the following analytical results:—

Carbon -	65.06	65.30	16 =	96	65.30
Hydrogen -	7.60	7.65	11	11	7.48
Oxygen - - - - -			5	40	27.22

The empirical formula for absinthine is therefore $C^{16}\,H^{1}\,O^{5}$, the rational formula probably $C^{16}\,H^{10}\,O^{4}+HO$. The preparation of a pure compound of absinthine with a metallic oxide of constant composition is exceedingly difficult.

Absinthine was dissolved in alcohol and mixed with some caustic potash, carbonic acid passed into the dark golden liquid as long as carbonate of potash separated, and then some ether added and filtered. In this solution of absinthine and potash, acetate of lead produced a beautiful yellow flocculent precipitate of absinthine and oxide of lead; but in the course of a few minutes it was converted into heavy white oxide of lead, and the alcohol became colored yellow by dissolved absinthine. It was also found impos sible to obtain the potash compound in a solid form. The spirituous solution of the bitter principle gives no precipitate with neutral acetate of lead, and but a slight turbidity with basic acetate of lead; I succeeded however in obtaining a lead compound in the following manner:—Basic acetate of lead and some ammonia were added to an alcoholic solution, and evaporated to dryness *in vacuo* over sulphuric acid. The dry residue was rubbed to powder, and treated first with water, and after drying with ether as long as anything was dissolved, and lastly alcohol was employed for washing. This compound gave 55.25 per cent. oxide of lead, leading to the formula $2(C^{16}\,H^{10})\,O^{4}+3PbO$, which requires 54.80 oxide of lead.—*Chem. Gaz. from Liebig's Annalen*, April, 1851.

POISONOUS PROPERTIES OF HOMERIA COLLINA.

(Nat. Ord. *Irideæ*.)

Homeria collina, Sweet. *Root a corm* or tuberous bulb, covered with a fibrous reticulated, hardened coat. *Shaft* erect, smooth, paniculately branched. *Branches* 2-3 flowered. *Spathe* 2-valved, awned. *Radical-leaf* strap-shaped, narrow, caudate, concave, abruptly pointed, outreaching the shaft. *Cauline leaves* 2-3 much smaller. *Corolla* ephemerous, of a yellow or vermilion color.

I introduce this plant (which is known to almost every child in the colony as the *Cape Tulip*) not for its therapeutical use, but for its obnoxiousness. The poisonous qualities of its bulbs appear to have been known to some extent years ago, but, judging from the rapidity with which death ensued in a recent case, when they had been eaten by mistake, it must be of a very poisonous kind. To Doctor Laing, Police Surgeon of Cape Town, I am indebted for the particulars of a melancholy case of poisoning, caused by this bulb.

A Malay woman, somewhat advanced in years, with her three grand-children, respectively of the ages of 12, 8, 6, partook on the 18th September last (1850) of a supper, consisting of coffee, fish, and rice, and ate along with this, a small basinful of the bulbs of the *Homeria collina*. The exact quantity which each ate is not well known. They appear to have supped between 7 and 8, and retired to bed at 9 o'clock, apparently in good health.

About one in the morning, the old woman awoke, with severe nausea, followed by vomiting, and found the children similarly affected. She endeavored to call for assistance, but found herself too weak to leave her bed; and when, at five o'clock, assistance arrived, the eldest girl was found *moribund*, and expired almost immediately. The little boy of eight years died an hour afterwards, and the youngest child was found in a state of collapse, almost insensible, with cold extremities, pulse scarcely 50 and irregular, pupils much dilated. The symptoms of the grandmother were nearly similar, but in a lesser degree, accompanied by constant efforts at vomiting. By using diffusible stimulants she and this child eventually recovered.

The body of the eldest child was examined twelve hours after death. Marks of intense gastritis were found, particularly about

the cardiac and pyloric orifices. The inflammation extended throughout the whole course of the small intestines, and there was great venous congestion of the brain.

It is remarkable, that in cases of poisoning from *Fungi*, violent diarrhœa is present along with vomiting, whereas, in the present case, obstinate constipation prevailed.

Most probably, all plants, belonging to this genus partake of this poisonous property, which, in the case mentioned above, was not dissipated by boiling.—*Lon. Phar. Jour. & Trans.* July 1, *from Floræ Capensis Medicæ Prodromus, by L. Pappe, M. D.*

ON KOKUM BUTTER, OR THE CONCRETE OIL OF MANGOSTEEN.

By Jonathan Pereira, M. D., F. R. S.

I have recently received from my friend Dr. Frampton, a specimen of Kokum Butter, or the Concrete Oil of Mangosteen, accompanied with the following extract from a note written by Colonel Le Messurier, by whom the oil was brought from India :—

"The Indian name of mangosteen is *kōkŭm*. You will, I think, find this oil of much use in all cases of chapped skin, hands, face, &c. Either use it scraping a little on to hot water, or by taking the powder and rubbing it on the hands or face.

"The preparation is made from the cold fruit, which is found abundantly on the slopes of the mountains on the western side of India, from 100 miles of Bombay to, I believe, Cape Cormorin."

As very few notices of this oil (or rather vegetable butter) are to be found in any works, a few observations concerning it may not, perhaps, be uninteresting to the readers of the Pharmaceutical Journal.

The mangosteen referred to by Colonel Messurier as yielding this oil, is the *Garcinia purpurea* of Roxburgh, who does not, however, notice the oil. He observes that, "Of this evidently very distinct species, I have only specimens with leaves, and the ripe fruit sent by Dr. Berry under the name of *mate mangostan*, which is found in gardens only, and supposed to have been originally brought from the Eastern Archipelago. It differs from every other species in the whole fruit, which is about the size of a small orange,

being throughout of a deep purple color, even the pulpy aril of the seeds."

In Graham's *Catalogue of the Plants growing in Bombay and its vicinity* (published at Bombay 1839) there is the following account of the tree and oil :—

"GARCINIA PURPUREA, ROX. Flora, 2, p. 642. Wright's Illust., No. 8, p. 125. Rumph, Amb. 3, *t.* 33.

"The *kokum.—Brindao* of the Portuguese: a very elegant tree ; head generally of a conical form ; branches drooping ; leaves dark green, shining ; fruit round and smooth, not furrowed ; size of a crab-apple ; when ripe, of a purple color throughout; it has an agreeable acid flavor, and is eaten by the natives. Workers in iron use the acid juice as a mordaunt. A concrete oil is obtained from the seeds, which is well known, and used at Goa for adulterating ghee (*Bombay Courier*, 13th June, 1830;) in gardens, Bombay ; pretty common in some parts of the Concan, in the ravines of Kandalla."

In the *Journal of the Asiatic Society of Bengal*, vol. ii., p. 592, for 1833, the mode of preparing the oil (which the writer calls *Kákùmb-ka-Tél*, or *Concrete Oil of Wild Mangosteen*) is thus described :—

"The oil is extracted from the seed by boiling. They are first exposed for some days in the sun to dry, and then pounded and boiled in water : the oil collects on the surface, and on cooling concretes into a solid cake. When purified from extraneous matter, the product is of a rather brittle quality ; of a pale yellowish hue, the shade inclining to green ; exceedingly mild and bland to the taste, melting in the mouth like butter, and impressing a sensation of cold on the tongue, not unlike what is experienced on allowing a particle of nitre to dissolve on the tongue. * * * * * * *

"The quantity of the concrete oil that may be obtained from the seeds may be taken at about one-tenth. From half a pound avoirdupois, or 3,500 grains of the seeds, I obtained 360 grains of the concrete oil in a moderate pure state. The above is somewhat more than one-tenth ; and with better management, the product might perhaps be greater. It requires, however, long-continued boiling to extract it, and it is still more tedious to purify it from the fibrous matter of the seeds."

The same writer also observes that,

"The concrete oil of the mangosteen might, I apprehend, be advantageously introduced into pharmaceutical preparations. It is used by the natives as a healing application. I have noticed among its sensible properties, that it impresses a sensation of cold on the tongue ; from which it would appear that it powerfully absorbs heat, as several salts do in the act of dissolving. It is easy to conceive that this property may often be of

the cardiac and pyloric orifices. The inflammation extended throughout the whole course of the small intestines, and there was great venous congestion of the brain.

It is remarkable, that in cases of poisoning from *Fungi*, violent diarrhœa is present along with vomiting, whereas, in the present case, obstinate constipation prevailed.

Most probably, all plants, belonging to this genus partake of this poisonous property, which, in the case mentioned above, was not dissipated by boiling.—*Lon. Phar. Jour. & Trans.* July 1, *from Floræ Capensis Medicæ Prodromus, by L. Pappe, M. D.*

ON KOKUM BUTTER, OR THE CONCRETE OIL OF MANGOSTEEN.

By Jonathan Pereira, M. D., F. R. S.

I have recently received from my friend Dr. Frampton, a specimen of Kokum Butter, or the Concrete Oil of Mangosteen, accompanied with the following extract from a note written by Colonel Le Messurier, by whom the oil was brought from India :—

"The Indian name of mangosteen is *kōkŭm*. You will, I think, find this oil of much use in all cases of chapped skin, hands, face, &c. Either use it scraping a little on to hot water, or by taking the powder and rubbing it on the hands or face.

"The preparation is made from the cold fruit, which is found abundantly on the slopes of the mountains on the western side of India, from 100 miles of Bombay to, I believe, Cape Cormorin."

As very few notices of this oil (or rather vegetable butter) are to be found in any works, a few observations concerning it may not, perhaps, be uninteresting to the readers of the Pharmaceutical Journal.

The mangosteen referred to by Colonel Messurier as yielding this oil, is the *Garcinia purpurea* of Roxburgh, who does not, however, notice the oil. He observes that, "Of this evidently very distinct species, I have only specimens with leaves, and the ripe fruit sent by Dr. Berry under the name of *mate mangostan*, which is found in gardens only, and supposed to have been originally brought from the Eastern Archipelago. It differs from every other species in the whole fruit, which is about the size of a small orange,

being throughout of a deep purple color, even the pulpy aril of the seeds."

In Graham's *Catalogue of the Plants growing in Bombay and its vicinity* (published at Bombay 1839) there is the following account of the tree and oil :—

"GARCINIA PURPUREA, ROX. Flora, 2, p. 642. Wright's Illust., No. 8, p. 125. Rumph, Amb. 3, *t.* 33.

"The *kokum.—Brindao* of the Portuguese: a very elegant tree ; head generally of a conical form ; branches drooping ; leaves dark green, shining ; fruit round and smooth, not furrowed ; size of a crab-apple ; when ripe, of a purple color throughout; it has an agreeable acid flavor, and is eaten by the natives. Workers in iron use the acid juice as a mordaunt. A concrete oil is obtained from the seeds, which is well known, and used at Goa for adulterating ghee (*Bombay Courier*, 13th June, 1830;) in gardens, Bombay; pretty common in some parts of the Concan, in the ravines of Kandalla."

In the *Journal of the Asiatic Society of Bengal*, vol. ii., p. 592, for 1833, the mode of preparing the oil (which the writer calls *Kákùmb-ka-Tél*, or *Concrete Oil of Wild Mangosteen*) is thus described :—

"The oil is extracted from the seed by boiling. They are first exposed for some days in the sun to dry, and then pounded and boiled in water : the oil collects on the surface, and on cooling concretes into a solid cake. When purified from extraneous matter, the product is of a rather brittle quality ; of a pale yellowish hue, the shade inclining to green ; exceedingly mild and bland to the taste, melting in the mouth like butter, and impressing a sensation of cold on the tongue, not unlike what is experienced on allowing a particle of nitre to dissolve on the tongue. * * * * * *

"The quantity of the concrete oil that may be obtained from the seeds may be taken at about one-tenth. From half a pound avoirdupois, or 3,500 grains of the seeds, I obtained 360 grains of the concrete oil in a moderate pure state. The above is somewhat more than one-tenth ; and with better management, the product might perhaps be greater. It requires, however, long-continued boiling to extract it, and it is still more tedious to purify it from the fibrous matter of the seeds."

The same writer also observes that,

"The concrete oil of the mangosteen might, I apprehend, be advantageously introduced into pharmaceutical preparations. It is used by the natives as a healing application. I have noticed among its sensible properties, that it impresses a sensation of cold on the tongue ; from which it would appear that it powerfully absorbs heat, as several salts do in the act of dissolving. It is easy to conceive that this property may often be of

general service in wounds or sores, accompanied with inflammation, which it is desirable to abate."

The specimens of kokum butter given to me by Dr. Frampton are in cylindrical masses of nearly three inches in diameter and between three and four inches long.

Kokum butter is a solid, firm, very friable substance. Between the fingers it feels greasy, somewhat like spermaceti; its color is pale yellow; it has a faint not disagreeable odor. In appearance it has considerable resemblance to a solid fat which was brought from India some years ago under the name of *Minia Batta, Stone Oil*, and which was said to be extracted by the natives of Borneo from a tree which is very abundant there (Dr. R. D. Thomson, *British Annual and Epitome of the Progress of Science*, p. 360, Lond. 1837.) In odor, however, it differs from the specimen of Minia Batta in my possession.

The anonymous writer, in the *Bengal Journal* above quoted, has drawn attention to the difference between the melting and congealing points of kokum butter. He found that it softened at from 90° to 100°, began to separate in a semi-fluid state at 106°, was partially opaque at 116°, but had attained perfect fluidity and transparency at 120°. Its congealing point, however, he found to be 90°. Mr. Redwood, who, at my request, kindly examined this subject, writes me that this butter "melts at about 98° F., remains fluid until cooled to 75°, and when it then begins to solidify the temperature rises to 92°, at which it becomes solid."

It is very slightly soluble in rectified spirit; more so in hot than in cold spirit. Mr. Redwood found that one ounce of rectified spirit dissolved only 1.7 grs. of the butter. In ether, however, it is readily soluble: one part of the butter dissolving almost immediately in about two parts of cold ether.

Heated with oil of vitriol it yields a crimson red solution, with the evolution of sulphurous acid.—*London Pharm. Journ.* Aug. 1851.

EXAMINATION OF THE VARIOUS METHODS OF ANALYSING ASHES.

In a paper entitled "Fundamental Experiments on the Determination of the Inorganic Constituents of Organic Bodies," M. Strecker has submited to criticism the methods proposed by Rose and Erdmann for the analyses of ashes. According to Rose, we must distinguish in organic substances between teleoxidic, merooxidic and anoxidic inorganic constituents. Strecker found, in his experiments, that inorganic constituents could not be extracted by water and acids from the cinder of the charred organic substance, even with artificial mixtures of charcoal and various substances, when they were contained therein in comparatively small quantity; but, on the other hand, they were completely extracted when present in larger quantity. Now this behavior accords with that ascribed by Rose to anoxidic substances; they contain small quantities, of inorganic constituents, whilst the teleoxidic, as for instance urine, bones, &c., contain large quantities. Now the same is the case with the ashes of plants; and Strecker is therefore of opinion, that the reason why the inorganic substances are sometimes entirely removed by water and acids from the charred mass, and at other times only in part, is owing solely to the proportion of the ash to the cinder, and not at all to any peculiar kind of combination of the inorganic substances with the charcoal.

Strecker then draws attention to the circumstance, that we must not suppose, from the presence of alkaline carbonates in the aqueous extract, that they are always derived from salts of inorganic acids with potash, since tribasic phosphate of potash, after calcination with sugar, yields carbonate of potash to water.* Strecker also observed the production of cyanides and sulphurets on following Rose's method, which may give rise to slight errors in the analysis. There is also a loss of chlorine according to Rose's

* Does not the formation of alkaline carbonate, when organic matter is heated with tribasic alkaline phosphate, show in opposition to the statement of Liebig and other chemists, that tribasic phosphate cannot exist in the animal fluids? otherwise alkaline carbonate should be contained in the ash, which they found not to be the case.—Ed. *Chem. Gaz.*

method, a circumstance which has likewise been observed by Rose and Weber.

Strecker has convinced himself by experiment, that on burning the substances in a muffle according to Erdmann's method, any loss of chlorides and phosphorus can be avoided by the addition of some hydrate of baryta to the subtances to be incinerated.* The same chemist has detected in the ashes of nitrogenous substances, for instance of the aqueous extract of blood, of bile, &c., the presence of salts of cyanic acid.

Staffel has likewise submitted Rose's method to examination, and has arrived at the same results as Strecker. For this reason, Staffel prefers the method proposed some time previously by Wackenroder, but so modified that the charred mass is always first exhausted with boiling water, after which the charcoal is incinerated. According to this method, the treatment of organic substances is divided into three parts as follows:—

I. The organic substances dried at 86° F., are carbonized in a crucible, the lid of which is stuck on with starch paste. The lid has a hole through which the gases escape; these are set light to. The charred mass is converted by pressure into a coarse powder, emptied into a flask, and repeatedly exhausted with boiling water until the liquid, which is generally transparent, leaves no perceptible residue on evaporation. When the extract is very alkaline, a current of carbonic acid is passed through it, after which it is evaporated to dryness in a platinum crucible until the weight of the residue remains constant.

The solution of the weighed residue is acidified with nitric acid. If, on treating the mass with nitric acid, a separation of silica occur, it is collected on a filter and weighed. The liquid filtered from the silica is mixed with a solution of silver, and the chlorine determined from the amount of chloride of silver obtained. The liquid filtered from the chloride of silver is freed from the excess of silver by muriatic acid, and then an excess of ammonia added to it; if no separation of phosphate of lime occur, the ammoniacal

* On this point Rose observes, "This certainly has many advantages. But the removal of a large quantity of sulphate of baryta, when lime is present, entails so much inconvenience, that the use of a weighed quantity of carbonate of soda is perhaps preferable."—*Ausfuhrl. Handb.*, vol. ii. p. 782.

liquid is mixed with oxalic acid; and if this produce a precipitate of oxalate of lime, it is collected upon a filter, dried and calcined, and so the amount of lime found. The liquid filtered from the oxalate of lime is now mixed with some chloride of barium, the precipitate of oxalate, sulphate and phosphate of baryta collected upon a filter, dried and calcined, then dissolved in dilute nitric acid, when the sulphate of baryta, if any be present, is left behind, and from its amount the quantity of sulphuric acid is calculated. After removal of the sulphate of baryta, a slight excess of ammonia is added to the acid liquor, the whole set aside for some time; and in case any phosphate of baryta is deposited, it is collected, dried and calcined, and the phosphoric acid calculated according to the formula $BaO + 2PO^5$, proposed by Wackenroder. There is still the potash and soda to determine in the liquid filtered from the oxalate, sulphate and phosphate of baryta. The baryta still contained in the liquid is removed with pure carbonate of ammonia, the liquid filtered from the carbonate of baryta evaporated to dryness in a porcelain dish, and the residue heated to a faint red in a platinum crucible. The residue of alkaline chlorides is dissolved in water, and the potash precipitated from the solution with chloride of platinum; the liquid filtered from the potassio-chloride of platinum is then examined for soda. The author however has, like other chemists, found no soda in inland plants.

II. This consists in the examination of the aqueous extract of the ash obtained by incinerating the charred mass after exhaustion with water. The charcoal is reduced to ash in a Hessian crucible having a slanting position, the ashes weighed, exhausted with hot water eight or ten times, when from 250 to 300 grms. of aqueous extract are obtained from 2 to 3 grms. of ash; these are divided into five or six parts. One part is acidified with nitric acid, mixed with solution of silver, and the chlorine determined from the weight of chloride of silver, and then calculated from the whole of the aqueous extract of the ash. A second portion is acidified with nitric acid, and then mixed with an excess of ammonia to obtain the silica; in general but mere traces are separated. A third likewise weighed portion of extract is mixed with chloride of barium, and the precipitate, if any form, collected, calcined and weighed; then dissolved in dilute nitric acid; and in case any insoluble sulphate of baryta remain, it is collected, and from its weight the

amount of sulphuric acid estimated. The liquid filtered from the sulphate of baryta is mixed with an excess of ammonia, then set aside for some time, the separated phosphate of baryta collected on a filter, dried calcined and weighed, and calculated according to the above formula. The liquid filtered from the mixed barytic precipitates is used for the determination of the potash and soda; it is freed by carbonate and caustic ammonia from baryta and other earths, evaporated to dryness, the ammonical salts dissipated, the residue dissolved in water and the potash determined by the chloride of platinum; the filtered liquid is examined for soda. A fourth weighed portion is mixed with oxalate of potash after acidification with nitric acid. When, as is generally the case, lime is present in the extract, the precipitate of oxalate of lime is heated to a faint red, and the lime calculated from the amount of the carbonate. The liquid filtered from the oxalate of lime is mixed with ammonia-phosphate of soda to precipitate the magnesia.

III. This consists in examining the insoluble portion of the charcoal ash left in II. This insoluble residue is digested with muriatic acid, and evaporated to dryness to remove the silica, again dissolved in warm muriatic acid, the residual sand and silica collected on a filter, the mixture dried, weighed, and the silica separated from the sand by solution in caustic potash.

The filtered acid liquid is divided into two equal parts, the one half employed for the estimation of the potash and soda, the other for the determination of the earths, peroxide of iron and phosphoric acid, according to the following plan. The one half is heated to boiling in a glass flask, mixed with acetate of soda and some acetic acid: the resulting precipitate, consisting of perphosphate of iron and phosphate of alumina, or of the first only, is collected on a filter dried, calcined and weighed. To separate the peroxide of iron from the alumina, the weighed precipitate is dissolved in muriatic acid diluted with water, and heated to boiling for some time with the addition of caustic potash. The separated peroxide of iron is collected upon a filter, and calculated for phosphate of iron according to the formula $Fe + PO^5$, proposed by Wackenroder. The alumina is precipitated from the filtered alkaline liquid by acetic acid as phosphate of alumina $= Al^2O^3 + PO^5$, dried, calcined and weighed. In this case we must not omit to examine the mixed precipitate obtained by acetate of soda for the presence of phos-

phate of lime, as frequently some is found in ashes which contain much phosphate of lime. If this precipitate be again dissolved in dilute muriatic acid, diluted with water, and heated to boiling with the addition of acetate of soda, it is obtained free from every trace of phosphate of lime. After the alumina and peroxide of iron have been precipitated by acetate of soda from the acid extract of the ash in the state of phosphate, the separated liquid is mixed with a solution of perchloride of iron (the amount of iron which is known and equal in weight to about the tenth or twentieth part of the entire weight of the ash), in order to determine the phosphoric acid still contained in it; the liquid itself is diluted with a considerble amount of water, heated to boiling in a flask with the addition of 0.5 grm. chlorate of potash, somewhat neutralized with carbonate of soda, and the whole of the iron added to the liquid thrown down as basic phosphate by a further addition of acetate of soda. The precipitate is collected on a filter, washed, dried, and ignited in a platinum dish after having been moistened with a few drops of nitric acid, and in this way a basic phosphate of iron obtained perfectly free from protoxide. The liquid filtered from the basic phosphate of iron is heated to boiling in a flask with carbonate of soda, in order to precipitate lime, magnesia and protoxide of manganese as carbonates. The filtered liquid is mixed with some phosphate of soda and ammonia, and the crystalline precipitate of ammonia-phosphate of magnesia obtained after twelve to twenty-four hours, added to that portion to be mentioned hereafter. The mixed precipitate of earthy carbonates is, after drying, heated to a strong red in a porcelain crucible, then dissolved in cold dilute nitric acid. If any manganese be present, it is left as Mn^3O^4. The separated liquid is mixed with oxalate of potash, the oxalate of lime calcined after drying, and calculated from the amount of carbonate. After separating the oxalate of lime, the liquid is mixed with ammonia-phosphate of soda free from magnesia. The crystalline precipitate obtained in the course of twelve hours' standing is mixed with that previously obtained, calcined, and the weight of magnesia calculated from it.

As the salts of potash cannot be always completely removed from the ashes by water, the second half of the acid solution is separated from all the earths by carbonate and caustic ammonia, the liquid evaporated to dryness, heated to redness to remove the

ammonical salts, the residue dissolved in water, the potash precipitated by chloride of platinum, and the filtered liquid then tested for soda.—*Chem. Gaz.* March 15, 1811, from Liebig's *Annalen*, lxxiii. p. 339; and *Archiv der Phar.* lxiv. p. 1.

ON SCUTELLARIA LATERIFOLIA.

By C. H. Cleaveland, M. D.

One of the most valuable *nervines* that have been discovered for our use, is to be found by the side of many of our streamlets, and in low marshy places in nearly every part of this State, and in sufficient quantities to supply the entire profession from Maine to Texas, should they but be convinced, that with *us* grow plants possessing medicinal properties as useful and as potent as are obtained from distant climes.

Such, I think, must be the belief of all who will make a trial of the *Scutellaria laterifolia*, in the place of the English or German Valerian (Valerian officinalis,) that has been the main article in use in this region in all *nervous diseases* since the day when Assafœtida went out of fashion.

The *Scullcap* has not only a most remarkable power of controlling the nervous excitability, as manifested in patients of an irritable temperament when fatigued, over excited, or suffering from slight physical derangement, but its most valuable properties are displayed in those severe and painful cases where we are led to use our most potent and active remedial means. In *Delirium-tremens*, *Tic-douloureux*, *Convulsions* from irritation of the ganglionic nerves or spinal cord, in *Chorea Sancti-viti*, *dental irritation* among children, as well as in the ordinary diseases of the nerves, where a soothing, quieting medicine is indicated, I have been led to prefer the Scutellaria above all other nervines or antispasmodics, except in those cases where an immediate effect is desirable. In such cases, of course we should resort to Chloroform, Ether, Musk, Castor, and the other drugs of the same class.

Among my reasons for this preference, I would mention the *tonic* property of the herb, which gives strength as well as quiet, its *su-*

dorific, and its *diuretic* powers—both tending to relieve the congestion that is usually present, which tends to perpetuate the disease. It never leaves that excitable, irritable condition of the system; when its soothing influence has worn away, that follows some of the other nervines; and it is so readily administered that but little delay need occur, and no evil result be anticipated.

I am led to call the attention of the profession to this plant in the earnest and decided manner I have used, mainly because of the high estimate I placed upon it; but in part from the disparaging remarks of the *United States Dispensatory*. I would not wish to detract from the fair and just fame of the compilers of that great work, or lessen the confidence that is so properly placed in it; but I think I know more of this plant, than those authors *could* know, and write according to my own observations. Without doubt the plant has been extolled too highly by some, and also recommended in cases where it has failed in answering the expectations of those who relied upon it, but not I think when used in such diseases as are indicated above. To me it has never seemed inert or powerless, and having had occasion to make *personal* use of it when the whole system was suffering severely from being poisoned by decomposing animal matter, I feel qualified to testify that "it *does* produce an *obvious* effect."

I have used it in the form of a saturated *tincture*, a *syrup*, and a *cold* and *warm infusion*; and I prefer the infusions to the other preparations when they can be conveniently prepared; the cold when it is desirable to obtain the tonic, and the warm when the sudorific effect is demanded. Half an ounce of the dried leaves to a tea cup full of water, will be very strong, and it may be drank *ad libitum*.

Of its curative power in cases of *hydrophobia* I can say nothing, never having had the opportunity to give it a trial; but should such a case present itself, I should make a trial of the plant in conjunction with other means.—*New York Register of Medicine and Pharmacy.*

Waterbury, Vermont, June, 1851.

ETHEREAL SOLUTION OF IODINE.

By R. Thomson, M. D.

To the Editor of the Boston Medical and Surgical Journal.

Sir,—I beg to offer to your notice a preparation of iodine, which is as yet unknown to the profession, except to a few in this locality whose attention I have directed to its efficacy as a counter-irritant. I have employed it in my practice for upwards of ten years, and generally with the most satisfactory results, in the most of those cases where the use of the tincture is commonly indicated. It is applied in the same way as the tincture, by means of a camel-hair pencil rubbed over the part, until it begins to produce a burning sensation in the part; then cover it with a pledget of wadding, so as to prevent evaporation. For the first fifteen minutes the burning sensation is pretty severe, so as to alarm some patients. Yet it soon becomes tolerable, but usually continues to be felt for several hours. The next day the cuticle has a dry hardened feel, having the iodine color; and great relief to deep-seated pain is obtained. In the course of two, three or four days, vesication will be observed around the edges of the superficial eschar which has now commenced to suppurate; and as the destroyed cuticle cleans off, a very copious discharge of purulent matter takes place, and may be kept up for two or three weeks under the popular application of a cabbage leaf, or oiled silk, which I usually apply on the second day. The surface of the sore assumes a fine granular appearance, and heals without leaving a cicatrix. I have often thought that, in cases of chronic inflammation of the joints, this application is more efficient than the caustic issue, relieves pain quicker, and can sooner be repeated.

I have frequently derived great benefit from keeping up a discharge from the chest in chronic affections of the lungs, making a sore the size of quarter or half a dollar at a time, and opening a new sore as the other heals.

This solution is very simply prepared. I commonly use the sulphuric ether of the shops; but the stronger the ether, the more efficient is the preparation. Hence the importance of obtaining a good article and in full strength.

I commonly put a quantity of pure iodine into a phial, and add sulphuric ether until dissolved; that is, the ether must be perfect-

ly saturated. To make the solution as strong as possible, I have added a few grains of the iodide of potassium, which furthers the capability of the ether to take up more of the iodine. There are different modes by which this can be prepared, that will be readily suggested to your several readers. All of them, however, will tend to the same result.

In some cases it may be used at a reduced strength, according to the amount of counter irritation or stimulation which individual cases may seem to require.

Dover, N. H. June 27, 1851.

Varieties.

Hyraceum.—This substance is much valued by many farmers, and well known among them, by the rather harsh and unpoetical name of *Dasjespis*. Thunberg and other travellers mistook it for a kind of bitumen; but it is in fact the secretion of a quadruped, which is common throughout the colony, and that lives gregariously on the rocky summits of mountains, viz: the *Klipdas* or *Hyrax capensis*. It is worthy of note, that this production has baffled the researches of eminent zoologists, who have failed, from even minute dissection, in discovering any specific secretory organ from which this matter could be derived. It may be asserted, however, that the *Hyraceum* is produced by the uropoetical system of the animal just named, and in order to explain this seeming anomaly, it must be observed, that the Hyrax drinks very seldom, if ever. Its urine, like that of the *hare*, is not thin and limpid as in other quadrupeds, but thick and of a glutinous nature, From a peculiar instinct, these animals are in the habit of secreting their urine always at *one* spot, where its watery parts evaporate in the sun, while its more tenacious portions stick to the rock and harden in the air. The fresh urine of the hyrax is of a reddish tint, and this has given rise to the opinion of those who took this production for a kind of menstrual secretion.

This substance is common on our mountains, and is to be found mixed with earth and dirt near the caves or crevices where these animals have their haunts.

In smell, and in its therapeutical effect, the *Hyraceum* most resembles the *Castoreum*, a remedy which is decreasing in quantity every year, and may therefore be replaced by the former. A new article of export would thus be gained. Amongst the farmers, a solution of this substance is highly spoken of as an antispasmodic in hysterics, epilepsy, convulsions of children, St. Vitus' dance, in short, in spasmodic affections of every kind.—*Pharm. Journ.*, from *Floræ Capensis Medicæ Prodromus, by L. Pappe, M. D.*

On Red Phosphorus. By Prof. A. Schrötter.—Two years ago, Schrötter showed that *red phosphorus* was not an oxide, but an allotropic modification of phosphorus, which can be effected not only under water and by the light of the sun, but also by a vacuum, and in gases which do not combine with phosphorus, and by the degrees of heat between 215 and 250° C. Furthermore, he showed that red phosphorus is amorphous, not so fusible or distillable, nor emitting so much light, and considerably less soluble and combustible than common phosphorus. Lastly, and what is most remarkable, he also proved that it is transformed into common crystallizable phosphorus when heated to 260° C. under exclusion of air.

Schrötter has since made the following discovery: if common phosphorus be exposed, during several days in a closed glass tube, to an uninterrupted heat, it not only changes into the red modification, but assumes even immediately a coherent form. In this latter state, the amorphous phosphorus is reddish-brown, on the fractured surface iron-black, of an imperfect metallic brilliancy, brittle, and breaks easily with a perfect conchoidal fracture; the fragments are irregular, and have pointed corners and sharp edges. The degree of hardness lies between that of calcspar and fluorspar; the density at 17° C.=2.089, the same quoted by Böttger for common phosphorus. The streak of this mass displays a red color of the pulverulent amorphous phosphorus. If exposed at common temperature to the influence of the atmospheric air, it remains unchanged.* If some tendency to acidulation on fusion manifests itself, it originates from the presence of common phosphorus, which cannot easily be removed.

With regard to common phosphorus, Schrötter has found that it decomposes the water at a temperature of 250° to 260° C., so that spontaneously inflammable phosphuretted hydrogen is developed.—*Lon. Pharm Jour.* May, 1851, from *Buchner's Repert.*, 1851, No. 19, p. 107.

On the Phosphorescence of Phosphorus. By R. F. Marchand.—Berzelius first suggested the idea that the emission of light by phosphorus was merely the effect of evaporation, and the consequent molecular change of phosphorus.

*Physiological experiments render it probable that red phosphorus may be administered in considerable doses without any injurious effects.

Prof. Marchand has now proved the correctness of this opinion by a number of carefully performed experiments, the result of which is that phosphorus emits light in all gases and vapors with which it does not chemically combine. In some gases the temperature may be very low, and in others it must reach the boiling point of phosphorus.

The emission of light is, therefore, only a consequence of evaporation, during which very probably molecular changes take place. It differs from that which occurs when phosphorus becomes oxydized, and both kinds of luminous appearances may separately occur. The emission continues as long as the phosphorus is able to evaporate and has tension. It ceases when the phosphorus is covered with some coating, by which evaporation is impeded. The tension is excessively low at a temperature of 15° C., but the emission of light does not become imperceptible until 22° C.

In a current of hydrogen, or carbonic acid perfectly devoid of oxygen, and at a proper temperature, phosphorus continues to emit light, as long as the vapors are carried off; neither litmus or starch with iodide of potassium betray any alteration, consequently, neither oxydation, nor formation of ozone, nor any change of the phosphorus takes place. It merely evaporates, and retains its vitreous condition in the dark, even when the experiment has been continued for many days.

If the experiment be performed in closed vessels, the development of light ceases after a short time, but only in consequence of the developed vapors impeding evaporation. As soon as this obstacle is removed, the emission of light reappears. The same also occurs on the Torricelian vacuum.

It is well known that gases and vapors which combine with phosphorus, *e. g.* the volatile oils and the different kinds of ether prevent its evaporation. It therefore follows that phosphorus emits no light in hydrogen, which has been deprived of oxygen by potassium, if the latter was contaminated with naphtha.

In compressed air phosphorus ceases to evaporate. Dr. J. Davy has stated, that a pressure of four atmospheres is necessary for this; but, Marchand found, that at a temperature of 50° C. two atmospheres sufficed to extinguish the phosphorus in dry atmospheric air. The same is the case with hydrogen and carbonic acid, if the pressure is suddenly removed; then not only does the phosphorus itself emit light, but there arises also a luminous vapor. The light disappears, however, as soon as the space is filled with the phosphorus vapor. When phosphorus becomes luminous in atmospheric air, not only evaporation but also combustion goes on, and in consequence, litmus paper is colored red.

Substances chemically related to phosphorus, such as sulphur, selenium, arsenic, and antimony, when they are vaporized, do not evolve light. But if the experiment be done in atmospheric air, these substances also possess

the capacity of modifying the oxygen and changing it into ozone.—*Ibid*, from *Ibid*.

Arctopus Root (Radix arctopi echiniti.)—Two cases, each containing about sixty pounds of the above drug, recently imported from the Cape of Good Hope, were put up to public auction on the 24th April, but met with no purchaser.

The root of *Arctopus echinatus*, Lin., nat. ord., *Umbelliferæ*, is employed in South America as a substitute for sarsaparilla. A sample of that recently imported consists of dry, irregular pieces formed by the transverse section of the root, in diameter varying from half an inch to nearly two inches, and in thickness from three-eighths to less than one-eighth of an inch; the cut surface is of a dingy brown color, and each piece has a zone-like mark midway between its centre and circumference. In some pieces the centre is surrounded by a well-defined dark portion. The margin or cortical part is blackish. Arctopus root has a weak, bitter, somewhat acrid taste, causing a slight flow of saliva; it is almost devoid of odor. In its general appearance, it suggests the idea of small and much discolored Columba root.—*Lon. Pharm. Journ.*, May, 1851.

Cedrine, the Active Principle of Cedron Seeds.—At a meeting of the Paris Academy of Sciences, on the 7th of April, M. Dumas announced that M. Lecoy had succeeded in separating the active principle on which the therapeutic properties of the *cedron* depends, and which he has named *cedrine*. —*Ibid.*

Solution of Lac a Substitute for Collodion.— As a substitute for collodion, Dr. Mellez recommends a solution of powdered shell-lac in highly-rectified spirit. The solution when cold, becomes gelatinous, and is used by joiners for polishing furniture. Spread on taffeta or linen and applied to the skin, it shows all the properties of collodion. It is impenetrable to the air, water, fat, and the organic secretions; it does not irritate the skin, and can be employed instead of dextrin for fractures. Wounds heal remarkably quick when dressed with this solution—*Ibid*, from Buchner's *Repertorium* Bd., Ieft. 3d, 398.

Removal of Carbonic Acid from Cellars and other places where it has accumulated.—Aubergier proposes to remove carbonic acid from cellars and other places, where, from fermentation or other causes, it has accumulated, by sprinkling about *liquor ammoniæ;* this combines with carbonic acid to to form carbonate of ammonia, and fresh air rushes in to fill up the space produced by the condensation of the acid.—*Ibid*, from *Moniteur Industriel*, 1850.

Preparation of Oily Emulsions.—The preparation of oily emulsions succeeds better, according to Overbeck, if the following proportions of gum be employed:—Different oils conduct themselves differently when rubbed down with gum; castor oil differing most in this respect from the other oils. In order to obtain a perfectly milk-white emulsion of castor oil, two drachms of gum are to be mixed with three drachms of water and one ounce of castor oil, which is to be poured, by a fine stream, into the constantly stirred mucilage. Any additional quantity of water is then readily taken up by the emulsion, which may also be prepared with only four scruples of gum, but without becoming quite white. For other oils half their weight of gum is required, and the quantity of water must be half the total weight of oil and gum. Thus one ounce of oil of almonds is to be first rubbed down with half an ounce of gum, and six drachms of water are then to be added at once. The so-called crackling [*Kracken*] of the emulsion appears here in a higher degree than after the usual method, and is a favorable symptom of the uniform distribution of the oil in the water.—*Lon. Pharm. Jour.* July, 1851, from *Central Blatt*, 1851, No. vi., p. 75.

Adulteration of the Oils of Lavender and Cassia.—Dr. Hartung Schwarzkopf obtained from a commercial house, which he does not in the least suspect of participating in the fraud, the oils of lavender and cassia, as being of the finest quality; the first of which does not at all possess the pure, agreeable perfume, but an accessory odor of turpentine and rosemary. This odor became more distinct when the oil was poured upon a cloth and moved about in the air, or when it was heated in a spoon. Iodine gave no trustworthy indications; but the adulteration with oil of turpentine was readily discovered when the oil was shaken with three times its quantity of alcohol of 0.83 p. weight, which was incapable of dissolving the oil. The presence of oil of rosemary could not be discovered by this test, since this oil dissolves in alcohol of the above strength. The oil of cassia possessed the pure odor of cassia, but was suspicious by its great liquidity. The usual tests for adulteration with spirits of wine gave no satisfactory results. Upon mixing the oil with water it did not become opaque, and a drop of the oil being allowed to fall into a glass filled with water produced no opaque streak. Perfectly dry calcium being thrown into the oil dissolved, and formed under the oil a liquid layer, which satisfactorily proved the presence of spirit of wine.—*Ibid*, from *Central-Blatt*, 1851, No. iv., p. 62.

Bleaching of Ivory by Sulphuric Acid.—Ivory knife-handles, which have become quite yellow from use, being left for from two to four hours in a watery solution of sulphurous acid, become white again. The acid in the gaseous form makes the ivory crack.—*Ibid* from *Ibid.*

On Bebeerine. By M. A. De Planta.—An organic base has been known in commerce for some time past, which was obtained in 1834 by M. Rodie,

from the bark of a tree called Bebeeru, in the colony of Demerara, and which has been subsequently described under the name of *Nectandra Rodiei*, by Sir Robert Schomburgh.

To prepare the bebeerine in a state of purity the author first followed the process described by Dr. Maclagan. The impure sulphate of commerce was dissolved in water, and bebeerine precipitated by ammonia. After having washed it, it was mixed with hydrate of lead, and the mixture evaporated in a water-bath. The dry residue yields to ether impure bebeerine, which is obtained by evaporation of the ethereal solution in the form of a brownish, resinous mass. In order to purify this product, M. Planta treats it with acetic acid, which imperfectly dissolves it; to the filtered liquor he adds an excess of acetate of lead, and then potash, until a precipitate is formed. The combination of bebeerine and oxide of lead, which is thus obtained, is dried in a water bath, and exhausted with ether. On distilling away the ether, the bebeerine is left in the form of a syrupy mass, having a slightly yellow color. It is dissolved in absolute alcohol, and the solution in a concentrated state, added drop by drop, to cold water kept constantly agitated. It forms a thick precipitate, which may be collected on a filter, washed and dried without agglutinating.

When thus prepared, bebeerine is a colorless powder, free from smell, unalterable in the air, highly electric, and, when ignited on plantinum foil, leaving a carbonacious residue, which completely burns away. It melts at 356° Fah., and on cooling becomes a vitreous mass. Above 356° Fah., it decomposes without volatillizing. It has a strong alkaline reaction, and completely neutralizes the acids, forming uncrystallizable salts. It is very soluble in water, but dissolves more easily in ether, and in all proportions in alcohol.

The following are some of the reactions of hydrochlorate of bebeerine. Potash, ammonia, and the carbonates of these alkalis, separate the bebeerine in the form of white mucilaginous flakes, but slightly soluble in excess of the precipitant. Bi-carbonate and phosphate of soda form white precipitates, chloride of gold a reddish brown precipitate, and chloride of platinum a yellowish white precipitate. Corrosive sublimate, iodide of potassium, sulphocyanide of potassium, and tincture or infusion of nutgalls, give white precipitates. Tincture of iodine gives a Kermes brown, and picric acid a sulphur-yellow precipitate. Iodic acid colors the solution of the hydrochlorate first pure red, then reddish brown, and finally deep red.

According to the analyses of M. de Planta, the composition of bebeerine may be represented by the formula $C_{38}\ H_{21}\ NO_6$. It is not, therefore, isomeric with morphine ($C_{34}\ H_{19}\ NO_6$), as was thought by Maclagan and Tilley. When a concentrated solution of hydrochlorate of bebeerine is added, drop by drop, to a weak solution of chloride of platinum, an orange amorphous precipitate is obtained, which has the composition $C_{38}H_{21}NO_6 + HCl., PtCl_2$ —*Ibid*, from *Journ. de Pharm.*

Porcelain Baths and Steam Tubs, introduced by Messrs. Rufford and Finch (Stourbridge.)—The superiority of porcelain over other materials usually employed for the construction of baths, consists in the nature of the surface, the cleanliness, and the light appearance. It is preferable to marble on account of not absorbing so much heat. The joints in the porcelain baths have always been an objection which it was desirable to overcome, and many attempts have been made to construct baths in one piece. Much difficulty was found in accomplishing this object on account of the tendency of the bath, from its size and weight, to loose its shape during the process of drying, and to crack when heated in the kiln. Messrs. Rufford and Finch have lately succeeded in obtaining the desired result, for which a medal was awarded by the Society of Arts. The first specimen of this description of bath was fixed in the St. Marylebone baths and wash-houses, above twelve months ago, and a very superior bath is now in the Crystal Palace, on the north-west division. Steam-tubs, wash-tubs, and other vessels of various forms, are also constructed of the same material. Some of these might be usefully employed for maceration and other pharmaceutical purposes.—*Ibid.*

An Act to Regulate the Sale of Arsenic, 5th June, 1851.—Whereas, the unrestricted sale of Arsenic facilitates the commission of crime: be it enacted by the Queen's most Excellent Majesty, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. Every person who shall sell any Arsenic shall forthwith, and before the delivery of such Arsenic to the purchaser, enter or cause to be entered in a fair and regular manner, in a book or books to be kept by such person for that purpose, in the form set forth in the Schedule to this Act, or to the like effect, a statement of such sale, with the quantity of Arsenic so sold, and the purpose for which such Arsenic is required or stated to be required, and the day of the month and the year of the sale, and the name, place of abode, and condition or occupation of the purchaser, into all which circumstances the person selling such arsenic is hereby required and authorized to inquire of the purchaser before the delivery to such purchaser of the Arsenic sold, and such entries shall in every case be signed by the person making the same, and shall also be signed by the purchaser, unless such purchaser profess to be unable to write (in which case the person making the entry hereby required, shall add to the particulars to be entered in relation to such sale, the words, "cannot write,") and, where a witness is hereby required to the sale, shall also be signed by such witness, together with his place of abode.

2. No person shall sell any Arsenic to any person who is unknown to the person selling such Arsenic, unless the sale be made in the presence of a witness who is known to the person selling the Arsenic, and to whom

the purchaser is known, and who signs his name, together with his place of abode, to such entries, before the delivery of the Arsenic to the purchaser, and no person shall sell Arsenic to any person other than a person of full age.

3. No person shall sell any Arsenic unless the same be, before the sale thereof, mixed with soot or indigo in the proportion of one ounce of soot or half an ounce of indigo at the least to one pound of the Arsenic, and so in proportion for any greater or less quantity: Provided always, that where such Arsenic is stated by the purchaser to be required, not for use in agriculture, but for some other purpose for which such admixture would, according to the representation of the purchaser, render it unfit, such Arsenic may be sold without such admixture, in a quantity not less than ten pounds at any one time.

4. If any person shall sell any Arsenic, save as authorized by this Act, or on any sale of Arsenic shall deliver the same without having made and signed the entries hereby required on such sale, or without having obtained such signature or signatures to such entries as required by this Act, or if any person purchasing any Arsenic shall give false information to the person selling the same in relation to the particulars which said last-mentioned person is hereby authorized to inquire into of such purchaser, or if any person shall sign his name as aforesaid as a witness to a sale of Arsenic to a person unknown to the person so signing as witness, every person so offending, shall for every such offence, upon a summary conviction for the same, before two justices of the peace in *England* or *Ireland*, or before two justices of the peace or the sheriff in *Scotland*, be liable to a penalty not exceeding twenty pounds.

5. Provided, That this Act shall not extend to the sale of Arsenic when the same forms part of the ingredients of any medicine required to be made up or compounded according to the prescription of a legally qualified medical practitioner, or a member of the medical profession, or to the sale of Arsenic by wholesale to retail dealers, upon orders in writing in the ordinary course of wholesale dealing.

6. In the construction of this Act, the word "Arsenic" shall include Arsenious Acid and the Arsenites, Arsenic Acid and the Arseniates, and all other colorless poisonous preparations of Arsenic.

THE SCHEDULE.

Day of Sale.	Name and Surname of Purchaser.	Purchaser's Place of Abode.		Condition or Occupation.	Quantity of Arsenic sold.	Purpose for which required
1 September, 1851.	John Thomas	Hendon	Elm Farm.	Farm Laborer.	5 pounds	To steep wheat.

(*Purchaser's Signature*) John Thomas.

Witness, James Stone, *Grove Farm, Hendon.*

(*Seller's Signature.*) George Wood.

Or if purchaser cannot write, Seller to put here the words, 'cannot write.'

—*Lon. Pharm. Journ.* July, 1851,

Wax and Stearine Candles.—According to established custom, wax candles only are held to be orthodox in Roman Catholic cathedrals and chapels. Some makers of stearine candles having endeavored to introduce their material, an objection was taken against the innovation, and the question was referred to the Pope, who gave his verdict as we are informed, in the following terms:

Pope. Is there not a little stearine in the wax candles? *Answer.* Yes. *Pope.* May there not be a little wax in the stearine candles? *Answer.* Yes.—*Pope.* Then you have wax and stearine—stearine and wax. I see very little difference.—*Ibid.*

Poisoning with Muriate of Baryta. By Dr. C. Wolf.—A student of medicine, who supposed that he had swallowed three teaspoonsful of sulphate of magnesia, was seized with tormina and vomiting; the pulse was weak and irregular; the tongue natural. Dr. Wolf at first supposed the case to be one of "summer cholera," excited by the purgative; but as in half an half an hour more he found his patient with ice-cold extremities; pulse 65, irregular and feeble; hands and feet powerless; paralysis of the left eyelid; the voice weak and incessant griping—he analyzed what remained of the so-called sulphate of magnesia, and found it to be muriate of baryta. The patient took only some sulphuric acid and castor oil, by which the griping was soon removed, but there came on retention of urine requiring the catheter. The muscular powerlessness soon disappeared, and in three days the patient was quite well. He had taken altogether three drachms of the salt. Dr. Wolf detected the chloride of barium in the evacuations by incinerating them.—*Ibid*, from *Casper's Wochenscrift in Schmidt's Jahrbücher*, No. 1, 1851.

Poisoning with Prussic Acid.—Mr. William Callum, auctioneer and proprietor of the Cheapside House Repository at Birmingham, has committed suicide under very lamentable circumstances. It appeared at the inquest, that Mr. Callum had for some time exhibited symptoms of a mind ill at ease, and he drank deeply, as a witness believed, to drive unpleasant thoughts from his mind; he had been straitened for money, and after his death no fewer than three writs were found upon him. He was of an excitable mind and irritable nature. His pecuniary embarrassments drove him to engage in bill tranasctions, and the end was a criminal act. A check for £1000, purporting to be signed by Sir George Chetwynd, was presented by Mr. Callum, or sent by him—the matter is not clearly reported—to Birmingham bank. Soon afterwards it was discovered to be a forgery. Mr. Suckling, the solicitor of the bank, with Mr. Glossop, inspector of the detective police, went to Mr. Callum's house at Balsall Heath. Mr. Suckling informed Mr. Callum of his errand, conversed with him, and announced that he must give him into the custody of the inspector. Callum

requested that he might be allowed to see his wife before he was taken away; and Mr. Suckling readily assented. While he had his arm around his wife's neck, the unhappy man swallowed the contents of a phial: Mrs. Callum noticed the act, and screamed. When the officer entered the room, Callum managed to utter "No," to his wife's statement, and could not articulate more. The phial had contained prussic acid. A surgeon was sent for; but before he could obtain any remedies, if such there were, the patient was dead—in fifteen minutes after swallowing the poison. The appearance of the body a short time after death, showed that a large quantity of the poison had been taken. The jury referred the act to "temporary insanity."—*Lon. Pharm. Journ.*, Aug. 1851.

Poisoning with Oil of Bitter Almonds.—On Thursday, July 24th, Mr. William Carter, the Surrey coroner, held an inquest of some hours duration, at the Queen's Arms Tavern, Spa Road, Bermondsey, on the body of Mrs. Sarah Spencer, aged twenty-six years, the wife of Mr. Spencer, the perruquier and perfumer, of King William Street, City, who died from the effects of prussic acid, at her private residence, No. 4, Spa Road. A great number of witnesses were examined, but the following are the short facts of the case as detailed by the coroner: Some few weeks since the deceased was confined with her first child, and ever since she has been in an exceedingly low and desponding state, but from what arising no one was able to form the slightest conception. She frequently spoke to her attendants of her unhappy state of mind, and more than once said that she should soon die. She also said that she was not like some other parties, or she would have died some time back, (alluding, as the witnesses thought, to her having taken poison on previous occasions.) On Monday last, she went out and purchased at the shop of Mr. Elkington, the chemist, of 10, Bamford Lane, Bermondsey, a drachm of the essential oil of bitter almonds and a pennyworth of linseed meal. She made application for a quarter of an ounce, under pretence of wanting it to scent some pomatum, but Mr. Elkington refused to sell her a larger quantity than one drachm. On leaving the shop, she remarked that it was useless for Mr. Elkington to be so determined, for if she chose she could get a small quantity at each shop in the neighborhood; and smiling, replied with all his precautions, he could not bottle up the Thames. She then repaired to her home, and the next morning her husband found her in bed in an insensible state. Dr. Paul, who had attended her in her accouchment, was sent for, and on his arrival found her suffering from the effects of prussic acid. Everything was done to save her life, but without effect, and she died in less than half-an-hour. The jury having consulted, returned a verdict of temporary insanity.—*Ibid*, from *Observer*.

Iodine.—An account has been published by M. Chatin of a series of experiments on animal and vegetable substances, with a view to ascertain the amount of Iodine that enters into their composition. All vegetables appear to contain more or less of this element, and particularly water-cresses. Wine is much more rich in iodine than water, milk richer in the element than wine, and asses' milk more rich in this respect that of cows. Eggs contain a large portion of iodine. A hen's egg weighing an ounce and a half, was found to contain as much iodine as a quart of milk from the cow.——*Ibid*, from *Galignani*.

On the copying Electric Telegraph. By C. F. Bakewell.—In the method adopted for transmitting copies of writing, the letters to be transmitted are written on tin-foil with varnish, so as to present a conducting and non-conducting surface. The foil is placed on the cylinder of the transmitting instrument, and a metal style in connection with a voltaic battery presses on the surface of the cylinder as it revolves. By this means the electric current is continually broken when the style is resting on the varnish, and as the style is made to tranverse by an endless screw from one end of the cylinder to the other, it passes necessarily over all the lines of the writing, and about eight times over each line. The receiving instrument is similar to the transmitting one, and on the cylinder of that instrument paper moistened with a solution of prussiate of potass in diluted muriatic acid is placed; the metal style on that instrument being a piece of steel wire. When the electric current from the positive pole of the voltaic battery passes through the steel point to the paper, a blue mark is made by the production of Prussian blue,—and when the cylinder is in motion, the effect is to draw a series of spiral lines on the paper; but as the lines are broken whenever the varnish writing on the transmitting cylinder interposes, the forms of the letters are transferred from one instrument to the other—the writing appearing of a pale color on a ground of blue lines drawn closely together. To produce this effect, it is requisite that both instruments should rotate exactly together, and this synchronous movement is attained by means of an electro-magnet—one instrument being made to regulate the other by retarding its motion at regular intervals. The regulation of the instrument is also greatly facilitated by a guide-line consisting of a strip of paper placed at right angles to the writing, by which, means the person having charge of the receiving instrument can ascertain exactly how much the speeds of the two instruments differ, and by the addition or abstraction of weight can bring the gaps formed by the strip of paper to fall directly under each other—which indicates that the two cylinders are revolving at the same rate. It was stated, in answer to questions by members present, that two hundred letters per minute might be copied by the instruments exhibited, and that five hundred in a minute are attainable. To illustrate the facility which this means of telegraphic

communication affords for transmitting secret messages, an apparently blank piece of paper was produced, on which a message had been impressed invisibly before the meeting of the Section, and by brushing it over with a solution of prussiate of potass the writing became instantly legible. —*Ibid*, from *Report of British Association in the Athenæum*.

Occurrence of Mercury in Corsica.—An abundant deposit of pure cinnabar, which furnished 80 per cent. of mercury on analysis, has been discovered in the above island.—*Chem. Gaz.*, July, 1851, from *Journ. de Pharm.*, March, 1851.

On a new Cinchona Bark containing Quinoidine. By Dr. F. L. WINCKLER. —Among some samples of barks recently received from London, was one labelled *Bark from Maracaibo*. The author has examined this bark, and has obtained the remarkable result, that it contains kinovate of quinodine in combination with a very peculiar yellow coloring substance, which produces no precipitate or alteration in perchloride of iron, and a considerable amount of quinate of lime, but only an exceedingly small quantity of quinotannine, and not a trace of quina-red.

The hot decoction of bark obtained by treating 100 grs. with 4 oz. of distilled water, when strained hot, was perfectly clear, pale reddish-brown, and did not become turbid on cooling. It had an exceedingly disagreeable bitter taste, not at all like bark, and could be easily filtered. The filtered solution, on being tested with tannin, showed the presence of a considerable amount of alkaloid; perchloride of iron colored the decoction slightly greenish-brown, without rendering it turbid; oxalic acid precipitated lime. The sulphate of copper gave no precipitate, although the bark contains a large quantity of kinovic acid. The author explains this by assuming that it is firmly combined with the coloring principle and the quinoidine. In the alcoholic extract of the bark, the decomposition of this substance is not even effected by lime.—*Chem. Gaz.*, April, 1851, from Buchner's *Repert.*, vol. v. p. 194.

On the Acrid Substance of the Root of Iris tuberosa. By M. LANDERER.— The acrid principle of *Iris tuberosa* is volatile. It separates upon the water distilled from the root as a stearoptene, in nacreous scales. When extracted from the root by means of ether, this evaporation furnishes an acrid extract, which, upon being rubbed upon the skin, produces considerable inflammation.—*Chem. Gazette*, April, 1851, from *Archiv. der Pharm.*, lxv. p. 302.

Editorial Department.

PRESCRIPTIONS IN ENGLISH.—The following communication from a New York correspondent, advocating the use of the vernacular in prescription writing, we publish for the benefit of our readers, many of whom agree with the author.

Mr. Editor,—Notwithstanding your phillipic against plain English names being used in writing prescriptions, I am of the opinion that such a law is the only remedy for numerous errors. The law, however, should not forbid the use of the scientific, or any other name, whether it be in the Greek, Latin, or any other language; but should require that the English name be used in addition to such other name. It should also require that the directions should be in plain English, or the native tongue of the patient. Then all would be plain and above board, with that honorable frankness which always characterizes good sense and real knowledge. This should apply equally to the quantities directed in the prescription, which should be put down in plain ordinary figures, or English words, thus: "1 ounce," "3 drachms," "equal parts," "15 drops," &c.

What is the object of this concealment practised by physicians—or rather, what is its utility? The object generally is to conceal from the patient and his friends, the medicine administered. But for what purpose? Evidently either to prevent their interference, to keep them ignorant, or to defend the craft of the physician. All these objects appear to me to be mischievous. In the first place, the patient has a full right to judge in his own case. He would be instructed if concealment were not used; and to promote the craft of the profession by secrecy, or a flourish of learned terms, appears to me quite exceptionable, and unworthy of the age in which we live.

In every instance, which has recently occurred, of death to the patient, the catastrophe would have been avoided, had the plain names been used. Shall life be trifled with in this manner, and death dealt out in the dark, when a little more frankness and homely plainness in the prescription would prevent it? It may be said that the apothecary should be more careful, or better qualified for his duties. This is very true, and the remark will equally apply to the physician. The life of the patient is in his hands, and carelessness or vanity is, in this case, a crime. Let the law guard against the fatal consequences, as well as may be.

I hope to see a law passed to this effect, in our State as well as yours, and also requiring that every bottle, box and parcel, of quack medicines, or medicines put up for sale in that style, shall contain a list of the articles used in its composition, and their proportions. Such a law would effectually obviate a mischievous concealment, which is now practised, and would inform the purchaser what he was about to administer to himself or his friend.

Yours, &c., OLIVER HULL,
New York.

We do not agree with Mr. Hull in his view of the necessity of writing prescriptions *entirely* in English; nor do we believe he has attributed the custom of employing Latin terms to the true motive in by far the greater

number of cases. We have no objection to the suggestion of writing out the quantities in full, as, for instance, "three drachms," or "fifteen drops;" but there is the same liability to error in the use of the digits as in the quantitative symbols usually adopted, as we see every day in the directions in English accompanying prescriptions. As to using the English name, in addition to the officinal one, as suggested, it is entirely superfluous if intended for the apothecary, provided the physician does his duty in writing the officinal name distinctly in full; but if the object is to enlighten the patient, let the physician give him a duplicate in English. What is wanting to render apothecaries inexcusable for errors is, that the physician should write his prescription distinctly—with ink, if possible—not to abbreviate the terms too closely, and use the nomenclature of the National Pharmacopœia, according to which our bottles and other recipients are labeled.

Whilst on this subject, we may mention that the carelessness in writing and compounding prescriptions, which has recently been productive of such unhappy results, has attracted the attention of the Philadelphia County Medical Society, who at a late meeting passed the following preamble and resolutions, viz.:

Whereas, The public mind has recently been much agitated in consequence of the carelessness of some of our apothecaries in compounding prescriptions, whereby life has, in several instances, been sacrificed; and whereas, it is notorious that many of the prescriptions sent to our drug stores bear upon their face the impress of a high degree of carelessness by the manner and haste in which they are written; and whereas, humanity and the welfare of the community demand that something should be done with the view of arresting this growing evil. Therefore,

Resolved, That we earnestly recommend to the Physicians of the City and County of Philadelphia to write their prescriptions legibly on good paper, and in conformity with the nomenclature of the U. S. Pharmacopœia, which being strictly a National work, should alone be recognized as a guide in this country.

Resolved, That a committee of three be appointed to request the appointment of a similar committee on the part of the Philadelphia College of Pharmacy, for the purpose of consultation in reference to the subject referred to in the foregoing preamble and resolution.

We may as well state that the Trustees of the Philadelphia College of Pharmacy, at their August meeting, appointed a committee of three, in accordance with the request of the Medical Society.

New Lebanon; its Physic Gardens and their Products.—The beautiful valley of New Lebanon, situated about 30 miles east of the Hudson river, in the State of New York, and noted for its attractive watering place, the resort of many pleasure-seeking travellers in the summer months, has long been celebrated for its gardens devoted to the culture of medicinal plants, with a view to the supply of apothecaries, druggists, and others in all parts of the United States. For a long time this business was solely in the hands of the people called "Shakers," who originated it as a regular pursuit, and who yet are largely concerned. During the past summer,

whilst on a visit to the valley of the Hudson, we accepted an invitation from Mr. Henry A. Tilden, to visit his gardens and laboratory situated in the township and village of New Lebanon, where he and his brother conduct an extensive business in the culture, drying and packing of plants, and the preparation of medicinal extracts. The Messrs. Tilden informed us that they have about forty acres cultivated under their immediate superintendence, somewhat in the following arrangement; 9 acres in Taraxacum, 2 in Conium, 3 in Hyoscyamus, 3 in Belladona, 3 in Lettuce, 3 in Sage, 2 Summer Savory, 2 Stramonium, 2 Burdock and Dock, 1 Marjoram, 2 Digitalis, 2 Parsley, Poppies, and Horehound, 1 Aconite and Balm. The remainder are occupied with Basil, Button Snake root, Blessed Thistle, Borage, Coriander, Feverfew, Hollyhock, Hyssop, Larkspur, Lovage, Marshmallow, Marygold, Mugwort, Mountain Mint, Southern Wood, Tansey, &c. The narcotics, especially the Hyoscyamus and Belladonna, require a rich soil, and they exhaust the land rapidly. These last attain a height in many instances of five feet, but in general from three to four. They are liable to be preyed upon more or less, at all seasons of their growth by insects and worms peculiar to each, to such an extent in some instances, as to destroy the crop. Conium maculatum grows spontaneously in all that region of country, having become naturalized. It is seen along the roads, and in fields that have been abandoned for a time, attaining often the height of six feet, and presenting a striking object to the eye, by reason of its subdivided foliage. For this reason, the Messrs. Tilden do not cultivate this plant very extensively, but depend largely on that of spontaneous growth, which they gather from the country many miles around, as far as the Vermont line, and in Massachusetts. It is probable that the Conium obtained in this way is really more active, weight for weight, than the cultivated, being less succulent. We noticed the Valeriana officinalis growing with great luxuriance, and as high as five feet, although its culture has not as yet been much extended. Besides the varieties cultivated, large quantities of indigenous plants are purchased from collectors in the West and South, which are required in their business.

Their factory or laboratory is an extensive, oblong, three storied building, in the basement of which is a powerful steam engine which performs the double duty of propelling the powdering apparatus, and of driving a double acting air pump connected with their vacuum evaporators.

The recent plants intended for extracts are brought to the mill from the gardens, reduced to a coarse pulpy state by a pair of chasers, and subjected to a powerful screw press to extract the juice. This is clarified by coagulation, strained, and the pure juice introduced into the large vacuum apparatus, holding several hundred gallons, where it is concentrated rapidly to a syrupy consistence, at a temperature varying 110°—130°, almost entirely free from the deteriorating influence of the atmosphere. In the construction of this apparatus, they have had a view to great extent of tubular steam-heating surface, so as to be able to accomplish the very large amount

of evaporation their business demands. The finishing apparatus is analogous to the vacuum pan of the sugar refiners. We witnessed the operation in progress with the thermometer standing at 112° F. They make annually about 8000 pounds of extracts from green plants and roots, consisting chiefly of Conium 2000 lbs, Dandelion 2000 lbs., Lettuce 1200 lbs, Stramonium 500 lbs., Butternut 800 lbs., Belladonna 500 lbs., Hyoscyamus 500 lbs., and so on. These extracts in the aggregate according to Mr. Tilden's estimate, are derived from about 300,000 lbs., of green material, and require the evaporation of more than 20,000 gallons of juice.

Besides these, a considerable amount of extracts are made from dry materials, both foreign and indigenous as Gentian, Rhubarb, Chamomile, May-apple, Horehound, Cohosh, etc. They are also about engaging largely in the manufacture of extract of Liquorice from foreign root.

In the powdering department they run burr stones and chasers, and use bolting and dusting apparatus. They powder large quantities of material on contract, besides that for their special business, amounting annually to from 50 to 60,000 pounds.

In the herb department, the quantity of material handled is very large. The plants are brought from the gardens into a large room in the factory building, where a number of girls are employed in picking them over to remove other plants accidentally present, and separating the decayed parts and the stems when desirable. They are then placed on hurdles, and exposed in the drying room till properly desiccated. Two presses are kept in operation, by which 2000 pounds of material are sometimes pressed in a week, and about 75,000 pounds per annum, including near three hundred varieties of plants.

At the time of our visit, thirty men and five girls were engaged in the several departments of their establishment.

When we consider the large amount of extracts of important drugs prepared in vacuo, which are thus thrown into the market to replace the former crude products, obtained by boiling down the juices, etc., in open vessels with a naked fire, according to the old method, we cannot but believe that much good will accrue to the medical practitioner in the increased power of these agents. The Messrs. Tilden have, thus far, been *directly* beneficial to the medical interests of the country. But they have also been indirectly useful by inducing their neighbors, the Shakers, from motives of competition, to adopt the vacuum pan, in lieu of the open boiler, in the preparation of their extracts. We have some few observations to make in reference to the medicine-producing department of this remarkable people, who received us kindly during a hurried visit whilst sojourning in their beautiful valley, but we are compelled to defer them till our next issue.

Pennsylvania Farm Journal. Edited by S. S. HALDEMAN, Lancaster, Pa.

We have received the numbers of this monthly publication, which dates its commencement April, 1851. If it is continued in the same spirit and

excellence that its pages thus far manifest, it will prove a valuable auxiliary in the promotion of the agricultural interests of this region. Its scope is comprehensive, and the tone of many of its articles of a high order. We wish it all success.

The Dispensatory of the United States of America. By GEORGE B. WOOD, M. D., and FRANKLIN BACHE, M. D. *Ninth Edition, carefully revised.* Philadelphia. Lippincott, Grambo and Co. 1851. pp. 1456, 8vo.

When a book becomes by usage an authority, those for whose guidance it is intended should watch it jealously, that no errors or fallacies creep into it, as it comes remodeled from the press. Our time has been too much occupied to review the work before us, and for the present we offer but a short notice.

The unexampled success of the Dispensatory of the United States has been owing less to any circumstances attending its publication, than to the intrinsic merits of the work itself; hence, as edition after edition has been thrown out from the press, its popularity has continued unabated, and we may safely say that at no former period of its history has the confidence of the Medical and Pharmaceutical professions in its accuracy and completeness been more general or stronger. In one sense it is the text book—the codex—of the United States Apothecary, more truly than is the Pharmacopœia; because, embodying, as it does, that work, very many apothecaries and physicians know the Pharmacopœia only through the medium of the Dispensatory—a fact which, however honorable to the authors of the latter, is to be regretted, as depriving the former of that universally authoritative position which it should hold. On the other hand, it may be said that had it not been for the deep interest taken in upholding the authority and dignity of the Pharmacopœia in their excellent Commentary, by the authors of the Dispensatory, that work would have been far less influential in assimilating the practice of pharmaceutists than it now is.

The present edition has been attended with an unusual amount of labor, arising chiefly from the fact that the revision of no less than *three* of the *four* Pharmacopœias published in Great Britain and the United States have taken place since 1849. The progress of chemistry, the improvements in practical pharmacy, and the discoveries in therapeutics, have all tended to introduce changes in the national and collegiate medical authorities, and the radical substitution of a new system of weights for the old troy standard, by the Dublin College, has added to the labor and perplexities of the Commentators. Substances formerly found in the appendix as unofficinal have been brought out in the regular text, and several, then upheld by pharmacopœial authority have shrunk back into that *omnium gatheram*, as of lesser importance.

In the portion of the work dedicated to materia medica, fewer changes have been made, and yet fewer are apparent, than in the latter, or pharma-

ceutical portion; and whilst the former has increased from 751 to 765 pages, the latter has been swelled from 477 to 523, notwithstanding the utmost exertions of the authors to compress the matter into the smallest space consistent with perspicuity, to accomplish which they have frequently resorted to foot notes in small type. In the first division of the work among the new matter, will be found the articles Hemidesmus, or Indian Sarsaparilla, an officinal of the Dublin Pharmacopœia; Matico; Cod-liver oil under its new name Oleum Morrhuæ; Saccharum Lactis, of the Dublin Pharm.; Silex Contritus of the London Pharm., 1851, which is used as an agent in making Medicated Waters; and Spiritus Pyroxilicus, the Dublin name for the commercial Wood Naptha. Important additions will be found at the articles Cinchona, Elaterium, Wax, and many others.

In the second division, the preliminary chapter on pharmaceutical operations and apparatus, has been re-arranged and extended, and embraces most of the newer suggestions in practical pharmacy, not included in the general observations at the head of Classes of Preparations. Several new figures have been introduced, illustrative of apparatus or operations. No part of the appurtenances of the pharmaceutical establishments of the United States is less attended to, or has less expended on it, than that of apparatus. Indeed, the sparsity of such means in many stores renders the practice of purchasing some preparations—that should always be made by the apothecary himself—almost necessary. The authors of the Dispensatory, aware of the value of the process of solution called *displacement or percolation*, and of its liability to be imperfectly executed, have taken pains to render the details of the process as clear as possible.

The articles Gallic Acid, Chloroform and Collodion, are fully commented on; all the facts connected with these new remedies being carefully brought out. Under the head Alcohol, we find Alcohol Amylicum, or fused oil, the substance used in the Dublin Pharm. for obtaining valerianic acid: the stronger alcohols of the Dublin and Edinburgh Colleges; and the diluted alcohols, which are very properly placed under the one head. If the pyroxilic spirit of the Dublin Pharmacopœia was a preparation, it should come under this head, as *Methylic Alcohol*. Among the antimonials, we observe that the Dublin College have adopted pure oxide of antimony in the preparation of tartar emetic, and directs pulvis antimonialis to be made by precipitating a mixture of tartar emetic, phosphate of soda and chloride of calcium, so as to get a mixture of ter-oxide of antimony and phosphate of lime. This preparation must be much more active and uniform than that prepared by the old method.

The chapters Argentum and Arsenicum are much extended. Under the head of Plasters we notice a figure of the apparatus employed for spreading plasters with margins. The latest information relative to the officinal extracts has been incorporated in the several notices of that class. 'Fluid Extracts' peculiar to our Pharmacopœia, and now so much in vogue, are noticed in detail under a separate head. Ferri Pulvis, Citras,

Ammonio-citras, Liquor-nitratis and Valerianas are fully noticed. We might go on in this way and exhibit the changes and additions all through the work, but our space and time does not admit. Suffice it to say, that in every instance, accessible to the authors, where new light has been shed on the preparations or materials of medicine, they have spared no pains to reflect it through their commentary.

Schools of Pharmacy.—The attention of our readers is directed to the Announcements of the Schools of Pharmacy, in the advertising columns.

The New York School commences its session on Monday, Nov. 3d, 1851, at their Rooms 511 Broadway.

The session of the Philadelphia School, commences on Tuesday the 16th of October, at 8 o'clock P. M., at the College Hall, Zane street, when Prof. Bridges will deliver a lecture introductory to the three courses. The regular lectures commence on Tuesday, Oct. 21st following.

We understand that the Cincinnati College of Pharmacy, intend opening their School this session. We cannot doubt that a wide field is open for the successful career of our western sister, one that should draw forth the most earnest endeavors of her teachers and patrons. Quackery, unblushingly presuming everywhere in this country, is more specially so in the great western valley, and needs all the ability of the advocates of scientific knowledge to withstand its baneful influence.

We have not, as yet, seen any announcement of the Massachusetts College of Pharmacy at Boston, recently established, and do not know whether they intend opening a Pharmaceutical School this winter, or not.

The prospects of our own School for the coming session are fair. Success to all.

Standards for Drug Inspectors.—We understand that the New York College of Pharmacy, has passed a preamble and resolutions, inviting the other Colleges of Pharmacy to meet in convention in New York, with a view to fixing on standards of quality, for the government of Drug Inspectors, to be recommended to Congress for adoption. This is an excellent movement, and very properly originates in New York, where by far the larger portion of the drug importations arrive. The object aimed at will require much deliberation to accomplish it effectually. We hope the other Colleges of Pharmacy will respond by sending delegates, and thus at least have an understanding in reference to the matter, which may subsequently result in the formation of a tariff of standards, calculated to work an important improvement in the quality of importations.

Notice to Subscribers.—The following is an Extract from the New Postage Law, which takes effect on July the 1st, 1851.

"Periodicals, &c., which shall be unconnected with any manuscript, or written matter, and which it may be lawful to transmit through the mail, of no greater weight than one ounce, for any distance not exceeding five hundred miles, one cent; and for each additional ounce, or fraction of an ounce, one cent; for any distance exceeding five hundred miles, and not exceeding one thousand five hundred miles, double these rates."

"Subscribers to all periodicals shall be required to pay one quarter's postage in advance; in all such cases the postage shall be one half the foregoing rates."

The weight of a single copy of this Journal is about 6 ounces, therefore the rate of postage will be as follows.

Within 500 miles, - - - -	6 cents per copy.
Over 500 and within 1,500 miles, - -	12 " "

If paid in advance, quarterly, the postage will be one half the above rates. Payable at the office of delivery.

ERRATUM.—At page 368, fifth line from the bottom, the formula should read—$Fe_2O_3 + PO_5$.

We were wrong in stating (see foot-note at page 289) that a resolution declaring delegates from Colleges of Pharmacy and Dentistry were ineligible as members of the Medical Association. Such a resolution was offered, but was referred to a Committee, to be reported on at the meeting next year.